



GÖĞÜS KALP DAMAR ANESTEZİ
VE YOĞUN BAKIM DERNEĞİ

27. *Ulusal*
Kongresi

24 - 25 Eylül 2021 Wyndham Grand İzmir Özdilek



İyileşen Covid 19 olgularının
anestezi yönetiminde zorluklar

Esin Öztürk



İyileşen Covid 19 Olgularının Anestezi Yönetiminde Zorluklar

Dr. Esin Öztürk

Coronavirus hastalığı 2019 (COVID-19)dünya çapında 38 milyondan fazla insanı enfekte etti ve bir milyondan fazla ölümlerle sonuçlandı.

14 Ekim 2020 itibariyle 26 milyondan fazla hasta iyileşti.

Giderek daha fazla hastanın "COVID-19 iyileştiği" düşünülürken, anestezi uzmanları, elektif ve acil cerrahi için bu yeni ortaya çıkan, yeterince anlaşılmamış hasta popülasyonunu tedavi etmeye ve yönetmeye başladı.



TÜRKİYE HAFTALIK COVID-19 TABLOSU

04 - 10 EYLÜL 2021

Hastalarda Zatürre
Oranı %

4,4

Yatak Doluluk
Oranı %

50,8

Erişkin Yoğun Bakım
Doluluk Oranı %

67,8

Ventilatör Doluluk
Oranı %

29,4

TEST SAYISI

2.110.541

VAKA SAYISI

155.346

HASTA SAYISI

7.902

VEFAT SAYISI

1.825

İYİLEŞEN SAYISI

203.990

ORTALAMA AĞIR
HASTA SAYISI

1.231

TOPLAM VAKA SAYISI

6.613.976

TOPLAM VEFAT SAYISI

59.384

Uzamış (Long)
COVID veya Kronik
COVID veya Kronik
COVID Sendromu
veya Post-akut
COVID-19;

COVID-19 tanısı konulmuş hastalarda semptomların bir aydan daha uzun süre devam etmesi olarak tanımlanmaktadır.

COVID-19 tanısı konulan hastaların %10 ila %20'sinde bir aydan daha uzun süren semptomlar görülmekte iken, hastaların %2,3'ünde semptomların 12 haftadan daha uzun sürdüğü gözlenmiştir.

- Baig AM. Chronic COVID Syndrome: Need for an Appropriate Medical Terminology for Long-COVID and COVID Long-Haulers. J Med Virol. 2020.
- Greenhalgh T, Knight M, A'Court C, Buxton M, Husain L. Management of post-acute COVID-19 in primary care. BMJ. 2020;370:m3026.
- Guan WJ, Ni ZY, Hu Y, Liang WH, Ou CQ, He JX, et al. Clinical Characteristics of Coronavirus Disease 2019 in China. N Engl J Med. 2020;382(18):1708-20.
- Sudre CH, Murray B, Varsavsky T, Graham MS, Penfold RS, Bowyer RC, et al. Attributes and Predictors of Long-COVID: Analysis of COVID Cases and Their Symptoms Collected by The COVID Symptoms Study App. medRxiv 2021.

POST-COVID SEMPTOMLARI

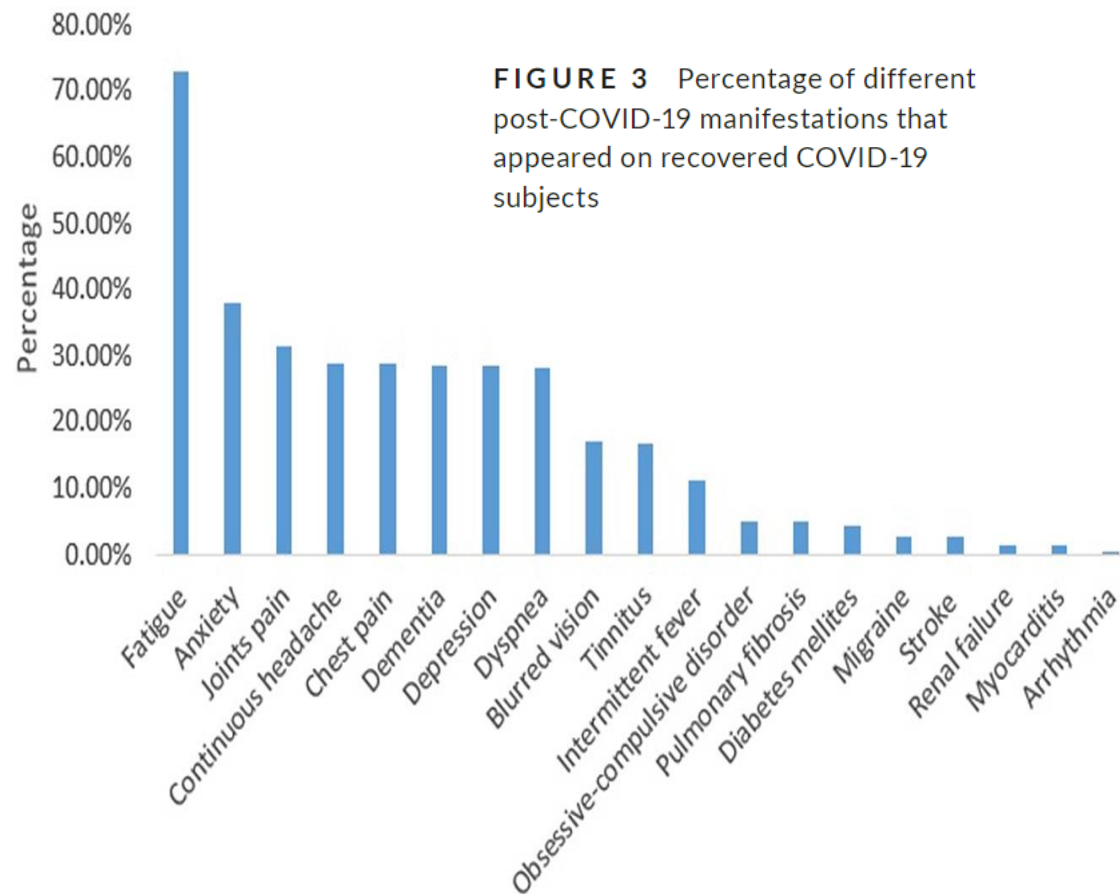
- En sık semptomlar
- Yorgunluk,
- Baş Ağrısı
- Dispne
- Kognitif Bozukluk
- Depresyon
- Deri Döküntüleri
- Gastrointestinal Şikayetleri İçerir

- En sık bildirilen Uzamış COVID semptomları şunlardır:
- Yorgunluk
- Nefes darlığı
- Öksürük
- Eklem ağrısı
- Göğüs ağrısı
- Düşünme ve konsantrasyon güçlüğü
- Depresyon
- Kas ağrısı
- Baş ağrısı
- Aralıklı ateş
- Çarpıntı

Daha ciddi Uzamış COVID komplikasyonları

- **Kardiyovasküler:** miyokardit, perikardit
- **Solunum:** akciğer fonksiyon anormallikleri
- **Böbrek:** akut böbrek hasarı
- **Dermatolojik:** döküntü, saç dökülmesi
- **Nörolojik:** koku ve tat almada bozukluk, uyku bozuklukları

Assessment and characterisation of post-COVID-19 manifestations

Marwa Kamal¹ | Marwa Abo Omirah² | Amal Hussein³ | Haitham Saeed⁴ **TABLE 1** Demographic data of COVID-19 subjects

Element	Percent
Age	
20-30 y	33.8%
31-40 y	49.1%
>40 y	17.1%
Gender	
Male	35.9%
Female	64.1%
Body mass index	
Normal (18.5-24.9)	26.5%
Overweight (25-29.9)	38%
Obese (>30)	35.5%
Smoking	
Smoker	9.8%
Non-smoker	90.2%
Severity of disease	
Mild	80.2%
Moderate (Oxygen therapy)	14.9%
Severe (ICU)	4.9%
Pregnancy	
Pregnant	1.4%

TABLE 2 Characterisation of post-COVID-19 manifestations

Item	Percent
Manifestations	
Fatigue	72.8%
Anxiety	38%
Joints pain	31.4%
Continuous headache	28.9%
Chest pain	28.9%
Dementia	28.6%
Depression	28.6%
Dyspnoea	28.2%
Blurred vision	17.1%
Tinnitus	16.7%
Intermittent fever	11.1%
Obsessive-compulsive disorder	4.9%
Pulmonary fibrosis	4.9%
Diabetes mellitus	4.2%
Migraine	2.8%
Stroke	2.8%
Renal failure	1.4%
Myocarditis	1.4%
Arrhythmia	0.3%

Anestezi uzmanları için;

Rezidüel pulmoner disfonksiyon

Arteriyel ve venöz embolik fenomenlerin devam eden sekelleri ile ilişkili antikoagülasyon

Miyokardiyal disfonksiyon

Kortikosteroid kürlerinden kaynaklanan adrenal yetmezlik

Nörolojik belirtiler ve kritik hasta alt grubunda rezidüel nöromusküler zayıflık- frajilite

Bu sorunların farkındalığı, bu büyüyen hasta popülasyonuna bakan anestezi uzmanları için çok önemlidir.



REZİDÜEL PULMONER DİSFONKSİYON

- COVID-19'un en yaygın şiddetli belirtisi akut solunum sıkıntısı sendromunun neden olduğu solunum yetmezliğidir.
- Hastalar, ek oksijen ihtiyacından ekstrakorporeal membran oksijenasyon desteği ihtiyacına ve hatta akciğer transplantasyonuna kadar ilerleyebilen içeren geniş bir spektrumdadır.

- COVID-19'dan iyileşen hastalar da;
- Restriktif akciğer hastalığını düşündüren rezidüel nefes darlığı
- Düzensiz solunum fonksiyon testlerini tanımlamıştır.





Research Paper

Follow-up study of the pulmonary function and related physiological characteristics of COVID-19 survivors three months after recovery

Yu-miao Zhao^{a,b,1}, Yao-min Shang^{c,1}, Wen-bin Song^{d,1}, Qing-quan Li^e, Hua Xie^e, Qin-fu Xu^f, Jun-li Jia^f, Li-ming Li^f, Hong-li Mao^g, Xiu-man Zhou^h, Hong Luo^{d,2,***}, Yan-feng Gao^{b,2,**}, Ai-guo Xu^{a,2,*}

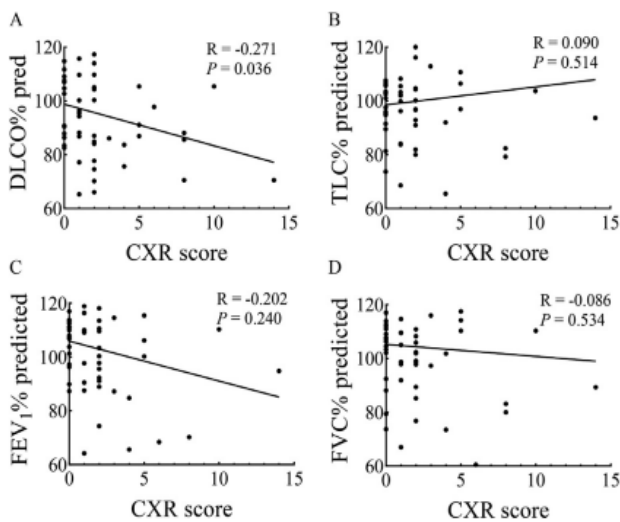


Fig. 3. Spearman's correlation analysis for CXR score 3 month after discharge with pulmonary function: DLCO% predicted (A), TLC% predicted (B), FEV₁% predicted (C), and FVC% predicted (D).

- 55 covid hastası, 4 hafif (7.27%), 47 orta (85.45%) and 4 ağır (7.27%), 39 anormal, 16 normal CT.
- 39 anormal CT, 12 (30.77%) anormal pulmoner fonksiyon. 16 normal CT grupta, 14 (12.50%)normal, 2 anormal AC fonksiyonu.
- COVID-19 göğüs BT taramalarında taburcu olduktan 3 ay sonra devam eden anormallikler
- Kalıcı akciğer hasarı ve uzun süreli pulmoner disfonksiyon

EclinicalMedicine 25 (2020) 100463

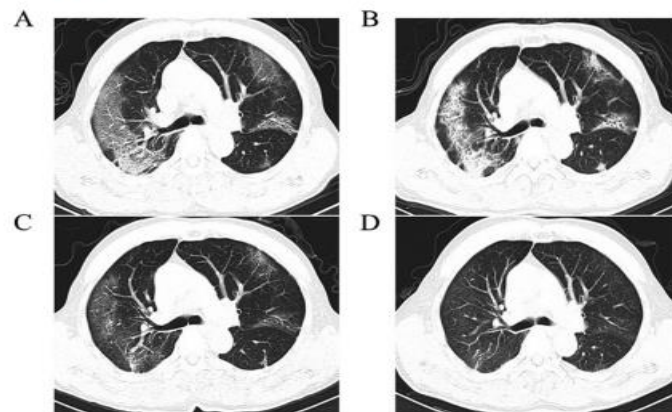


Fig. 2. Follow-up thin-section CT imaging of 63-year-old man with confirmed COVID-19 pneumonia with dry cough. (A) First thin-section chest CT in hospital on February 2, 2020 (7 days after symptoms onset). CT imaging shows GGO associated with smooth interlobular and intralobular septal thickening (crazy paving). (B) Crazy paving with some consolidations were observed over 7 days. (C) On March 4, 2020, scans showed that the previous lesion was absorbed and parenchymal bands with residual GGO were observed. (D) On May 2, 2020, interstitial thickening and residual GGO were observed. CXR: chest radiography.

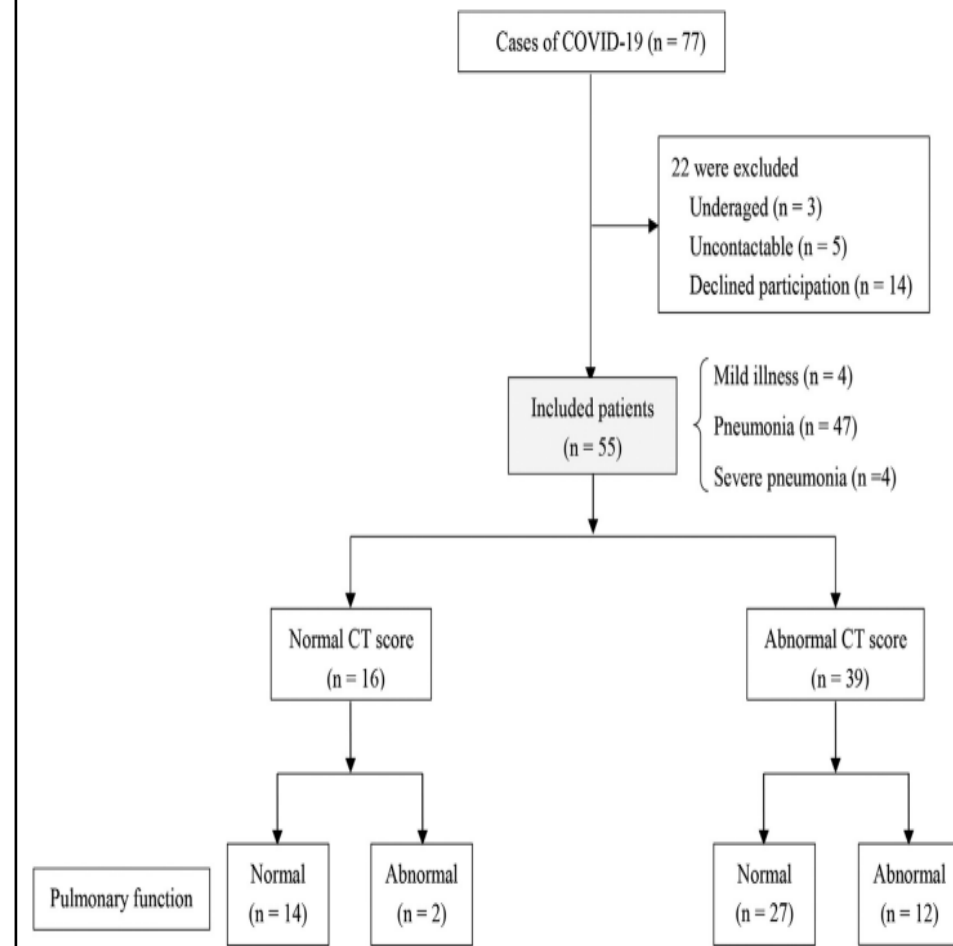


Fig. 1. Enrolment of patients and follow-up at 3 months after hospital discharge. COVID-19: Coronavirus Disease 2019.

Mortality and pulmonary complications in patients undergoing surgery with perioperative SARS-CoV-2 infection: an international cohort study

COVIDSurg Collaborative*

Summary

Background The impact of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) on postoperative recovery needs to be understood to inform clinical decision making during and after the COVID-19 pandemic. This study reports 30-day mortality and pulmonary complication rates in patients with perioperative SARS-CoV-2 infection.

Methods This international, multicentre, cohort study at 235 hospitals in 24 countries included all patients undergoing surgery who had SARS-CoV-2 infection confirmed within 7 days before or 30 days after surgery. The primary outcome measure was 30-day postoperative mortality and was assessed in all enrolled patients. The main secondary outcome measure was pulmonary complications, defined as pneumonia, acute respiratory distress syndrome, or unexpected postoperative ventilation.



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See Online/Comment
[https://doi.org/10.1016/S0140-6736\(20\)31256-3](https://doi.org/10.1016/S0140-6736(20)31256-3)

*Collaborating authors are listed in the appendix (pp 1–7)

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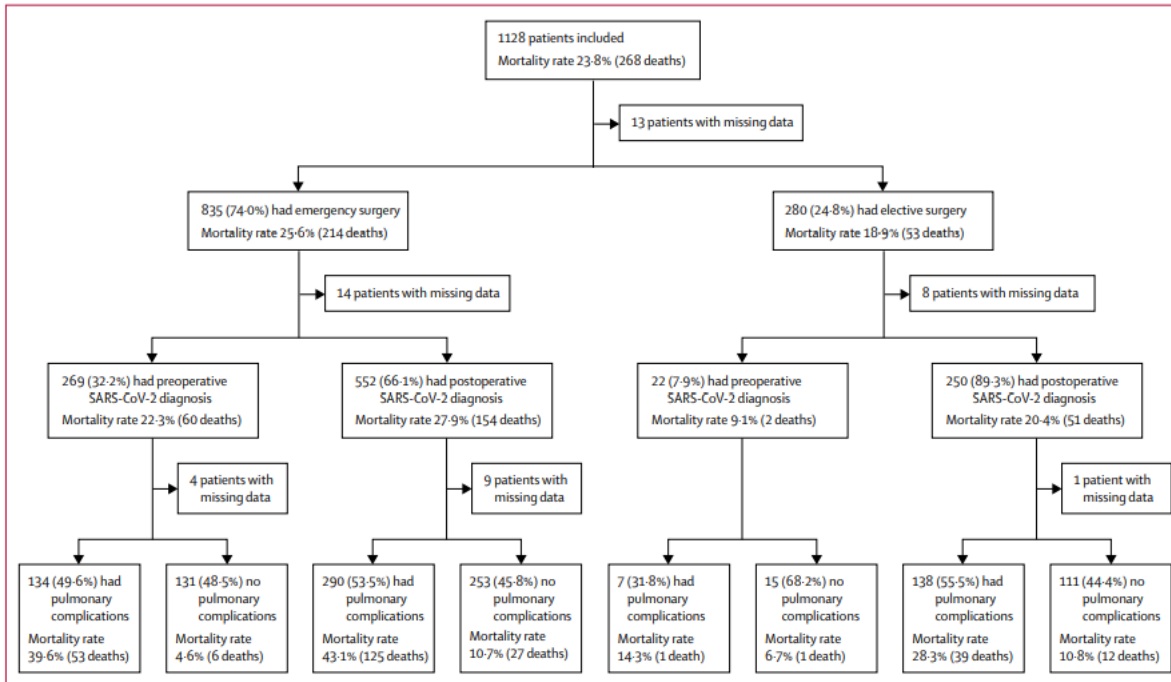


Figure 1: 30-day mortality rates by timing of surgery and development of pulmonary complications
Patients with missing data are included in denominators (appendix p 21). Pulmonary complications are pneumonia, acute respiratory distress syndrome, or unexpected postoperative ventilation. SARS-CoV-2=severe acute respiratory syndrome coronavirus 2.

	30-day mortality			Pulmonary complications		
	No (n=845)	Yes (n=268)	p value	No (n=526)	Yes (n=577)	p value
Urgency of surgery	..	..	0.020	..	..	0.873
Elective	225 (80.9%)	53 (19.1%)	..	130 (46.9%)	147 (53.1%)	..
Emergency	610 (74.0%)	214 (26.0%)	..	387 (47.5%)	428 (52.5%)	..
Missing	10	1	..	9	2	..
Anaesthesia	..	..	0.383	..	..	0.488
Local	34 (69.4%)	15 (30.6%)	..	24 (49.0%)	25 (51.0%)	..
Regional	119 (78.8%)	32 (21.2%)	..	78 (51.7%)	73 (48.3%)	..
General	658 (75.2%)	217 (24.8%)	..	403 (46.5%)	464 (53.5%)	..
Missing	34	4	..	21	15	..

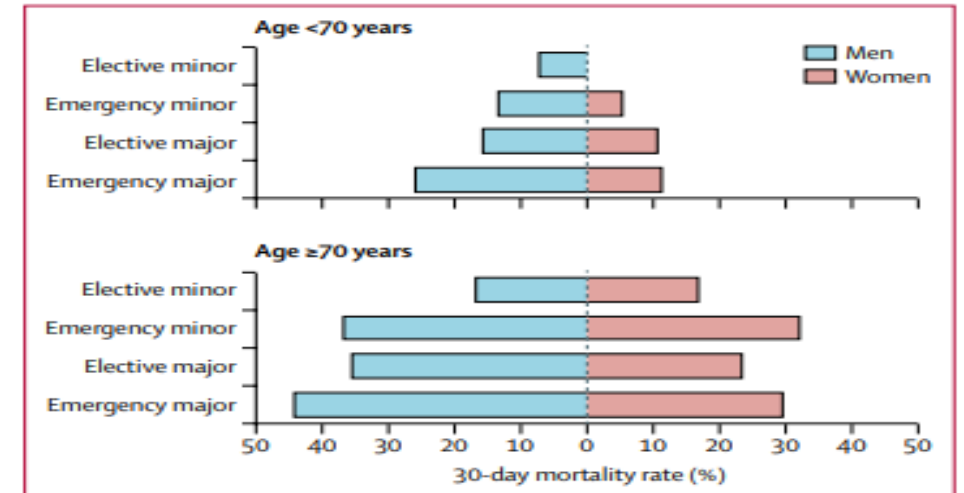


Figure 2: 30-day mortality rates by patient subgroup
Grade of surgery was classified based on the Bupa Schedule as either minor (minor or intermediate in Bupa Schedule) or major (major or complex major in Bupa Schedule).

Coronavirus Pandemic

Lung Fibrosis Sequelae Af

Agus Dwi Susanto^{1,2}, Paulus Arka T...
Ferdynand Zaron⁴, Intan Aryanti⁴, Sa

J Infect Dev Ctries 2021; 15(3):360-365. doi:

Figure 1. Chest X-ray on December 2019 (medical check up file).

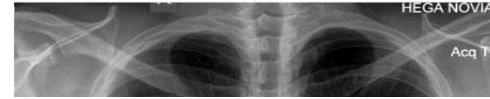


Figure 2. Chest X-ray 18th March 2020 (on the first day come to private hospital) with bilateral pneumonia.

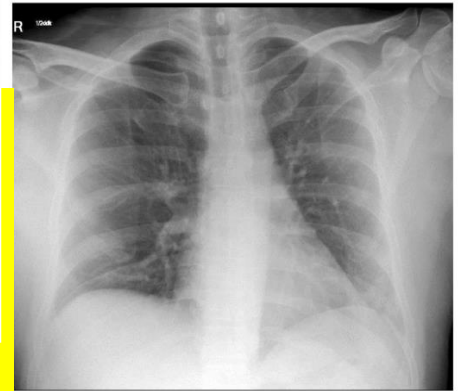


Table 1. Spirometry result of patient in April 2020.

Parameter	Result	Prediction value	%
FVC	1,650	3,710	44.47%
FEV1	1,550	2,950	52.54%
FEV1/FVC	93.88	79.96	

(A) and coronal (B) view chest CT scan on May,

Figure 3. Axial (A) and coronal (B) view chest CT scan on May, 19th 2020.

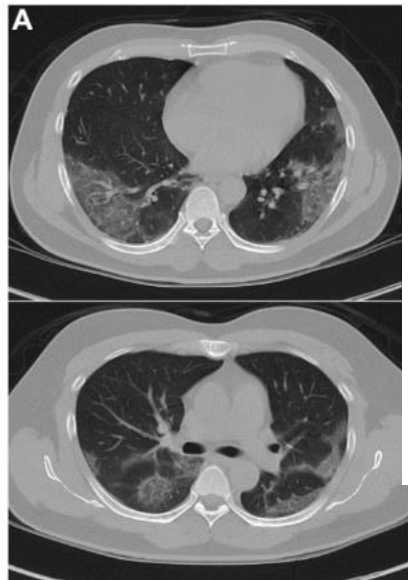


Table 2. Spirometry result of patient in May 2020.

Parameter	Result	Prediction value	%
FVC	2,550	3,710	68.93%
FEV1	2,550	2,950	86.61%
FEV1/FVC	100	79.63	

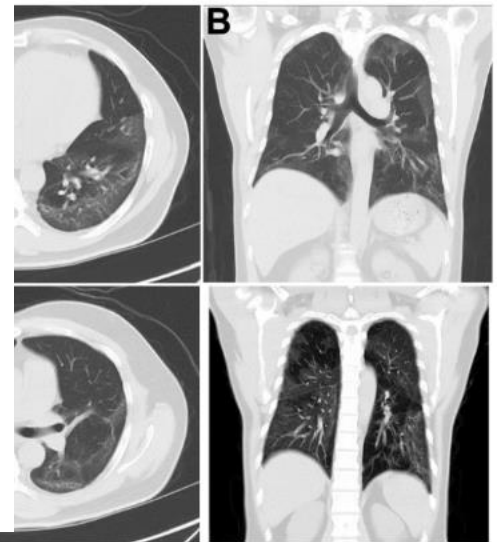


Table 3. Comparison of spirometry results in April and May.

Parameter	Result	
	April (after recovery)	May (2 month after recovery)
FVC	1,650 (44.47%)	2,550 (68.93%)
FEV1	1,550 (52.54%)	2,550 (86.61%)
FEV1/FVC	93.88	100

Chest CT scan showed bilateral ground-glass opacity (GGO) appearance especially at posterior and lateral site, consolidation accompanied by fibrotic lesion that affects all posterior segments of lung bilaterally.

Chest CT scan showed (in the lung window) the consolidation accompanied by fibrotic lesion which affects all posterior and lateral segments in both lungs. Ground-glass opacity was seen in the laterobasal segment of right lung, and the 1st and 2nd of pulmonary segments bilaterally.

Consolidation of the apical segment, part of the anterior segment, lateral segment of the right pulmonary mediate lobe; apicoposterior segment, left lung inferior segment and almost both of lingula and mediate lobe are thinner compared to previous CT scan. Multiple fibrotic parenchymal bands and mild dilatation of the distal bronchial branches were found especially in the posterior segment of the inferior and mediate lobes of both lungs.

Guideline**SARS-CoV-2 infection, COVID-19 and timing of elective surgery**

A multidisciplinary consensus statement on behalf of the Association of Anaesthetists, the Centre for Peri-operative Care, the Federation of Surgical Specialty Associations, the Royal College of Anaesthetists and the Royal College of Surgeons of England

El-Boghdadly et al. | SARS-CoV-2 infection and timing of surgery

Anaesthesia 2021, 76, 940-946

Table 1 Phases of COVID-19 [29].

Phase	Definition
Acute COVID-19	Symptoms and signs of COVID-19 for up to 4 weeks after infection
Ongoing symptomatic COVID-19	Symptoms and signs of COVID-19 from 4 weeks up to 12 weeks after infection
Post-COVID-19 syndrome	Symptoms and signs that develop during or after an infection consistent with COVID-19, continue for more than 12 weeks and are not explained by an alternative diagnosis. It usually presents with clusters of symptoms, often overlapping, which can fluctuate and change over time and can affect any system in the body. Post-COVID-19 syndrome may be considered before 12 weeks while the possibility of an alternative underlying disease is also being assessed.
Long COVID	Symptoms and signs that continue or develop after acute COVID-19, which includes both ongoing symptomatic COVID-19 (from 4 to 12 weeks) and post-COVID-19 syndrome (≥ 12 weeks)
Resolved COVID-19	Previous symptoms and signs of acute COVID-19 that have completely resolved.

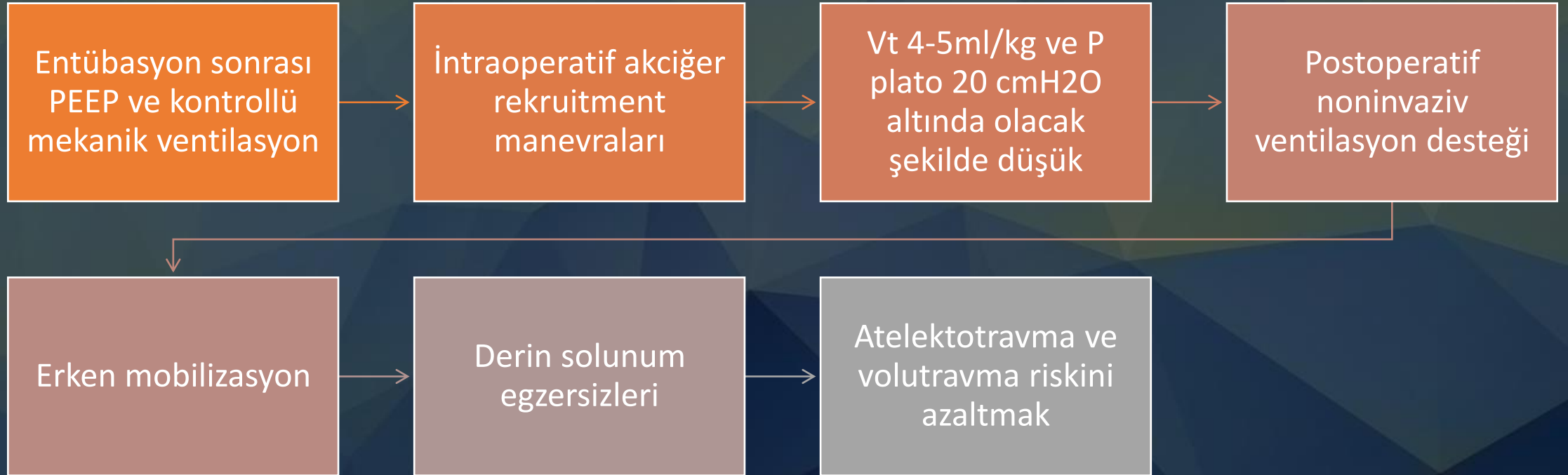
- Semptomatik olmaya devam eden ve PCR negatif olan hastalarda, en makul olanı yaklaşım, elektif cerrahiyi semptomlar düzelene kadar ertelemek olacaktır.
- Ameliyat ise zamana duyarlı ancak acil bir durum değil (malignite gibi), İntraoperatif ve potansiyel postoperatif ventilatör yönetimine rehberlik etmesi için akciğer patolojisini sınıflandırmak için solunum fonksiyon testleri elde etmek mantıklıdır.
- Acil bir durumda, ameliyat devam etmeli ve pulmoner patolojinin karakterizasyonu ve tedavisi intraoperatif olarak yapılmalıdır.



Editorial

Anesthetic Considerations for Recovered COVID-19 Patients

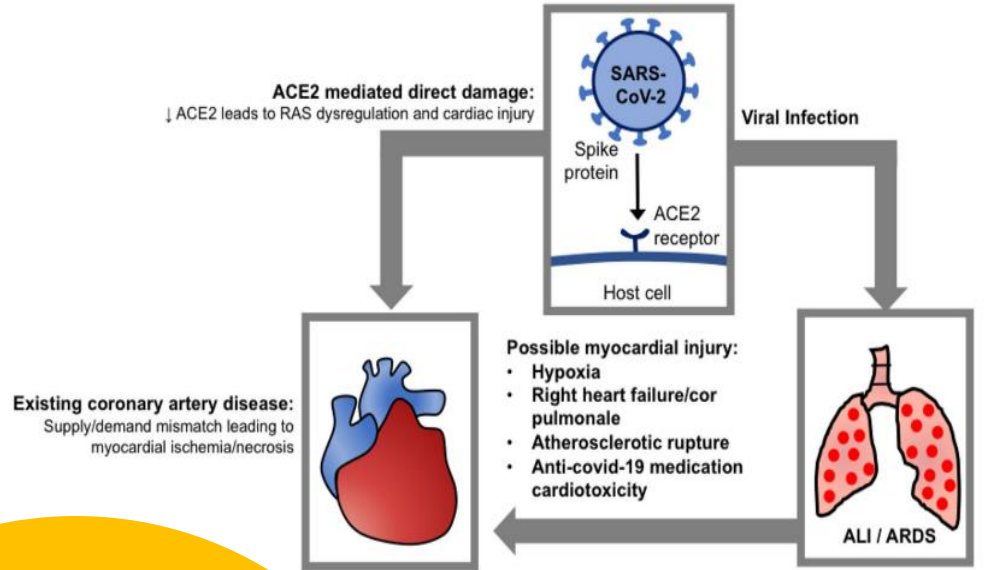






A Review of Persistent Post-COVID Syndrome (PPCS)

Bryan Oronsky¹ · Christopher Larson¹ · Terese C. Hammond² · Arnold Oronsky³ · Santosh Kesari² · Michelle Lybeck¹ · Tony R. Reid¹



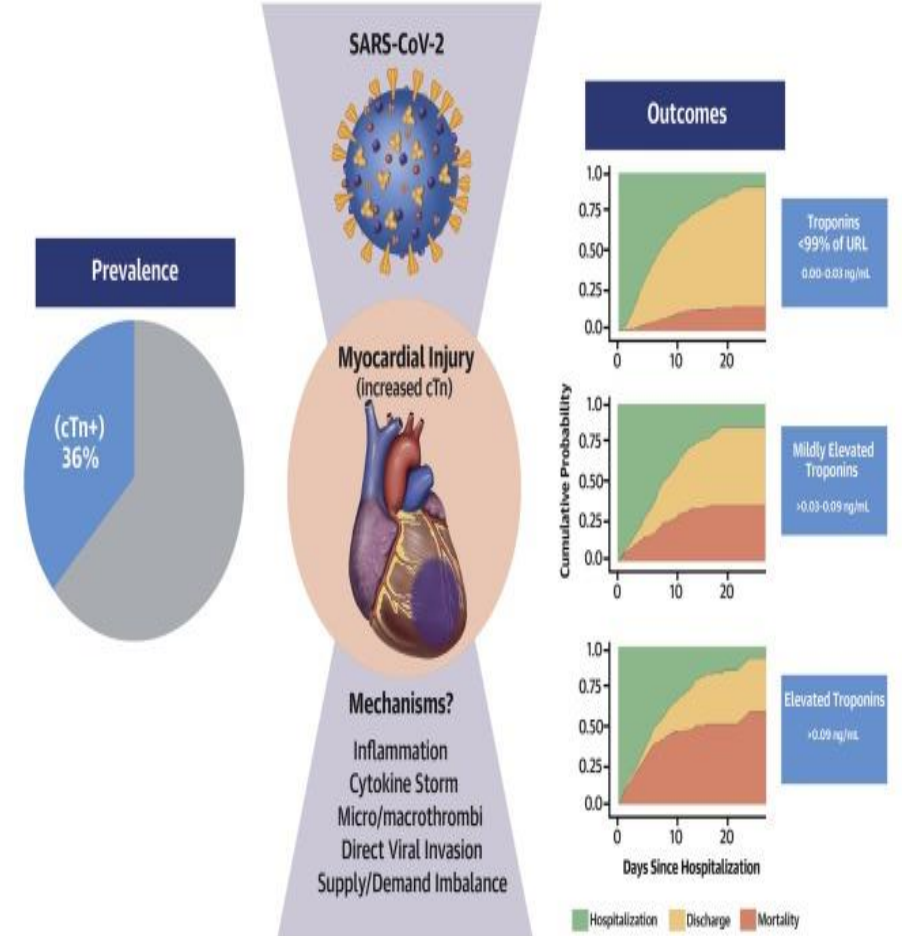
...uced cardiac injury. ALI/ARDS: acute lung injury/adult respiratory distress syndrome; RAS: ...ing enzyme 2

MİYOKARDİYAL DİSFONKSİYON

COVID-19 hastaları genellikle şu belirtilerle başvurur:
Kalp yetmezliği ve miyokardit dahil olmak üzere miyokard hasarı ve/veya mevcut kardiyovasküler hastalığın alevlenmesi
Yüksek troponin T ve beyin natriüretik peptidi (BNP)

- Artan pulmoner vasküler direnç pulmoner hipertansiyon ve sağ kalp yetmezliği
- Hipokalemi ve kardiyak aritmilere yol açan sekonder hiperaldosteronizm dahil kardiyovasküler sistem üzerindeki zararlı etkilere aracılık eden renin-anjiyotensin sisteminin (RAS) aşırı uyarılması
- Aterosklerotik plak yırtılması, özellikle önceden var olan koroner arter hastalıkları ,enfarktüsü hızlandıran proinflamatuvar sitokinlerin etkisi yoluyla
- ACE-2 aracılı viral kardiyomiyosit istilası, miyokardite neden olur
- Azalmış venöz dönüş ve ARDS'ye bağlı ciddi hipoksemi kombinasyonundan kaynaklanan miyokardiyal oksijen arzı/talebi uyuşmazlığı, miyokardiyal iskemi/nekroza yol açar

CENTRAL ILLUSTRATION: Prevalence, Potential Mechanisms, and Impact of Myocardial Injury in Coronavirus Disease-2019



Lala, A. et al. J Am Coll Cardiol. 2020;76(5):533-46.

Covid-19 Tedavisinin Kardiyotoksik Etkileri

- Makrolid antibiyotiđi, azitromisin, uzamış QT aralığı ile ilişkili
- Kalpte iletim kusurlarına neden olabilen klorokin/hidroksiklorokin
- Kolesterol seviyelerini artıran tocilizumab
- PR ve QT aralıklarını uzatabilen ve ayrıca statinler dahil diđer kardiyak ilaçların metabolizmasını etkileyen CYP3A4 aktivitesini inhibe edebilen proteaz inhibitörleri olan lopinavir/ritonavir.

Association of Cardiac Injury With Mortality in Hospitalized Patients With COVID-19 in Wuhan, China

Shaobo Shi, MD; Mu Qin, MD; Bo Shen, MD; Yuli Cai, MD; Tao Liu, MD; Fan Yang, MD; Wei Gong, MMSC; Xu Liu, MD, PhD; Jinjun Liang, MD, PhD; Qinyan Zhao, MD, PhD; He Huang, MD, PhD; Bo Yang, MD, PhD; Congxin Huang, MD, PhD

IMPORTANCE Coronavirus disease 2019 (COVID-19) has resulted in considerable morbidity and mortality worldwide since December 2019. However, information on cardiac injury in patients affected by COVID-19 is limited.

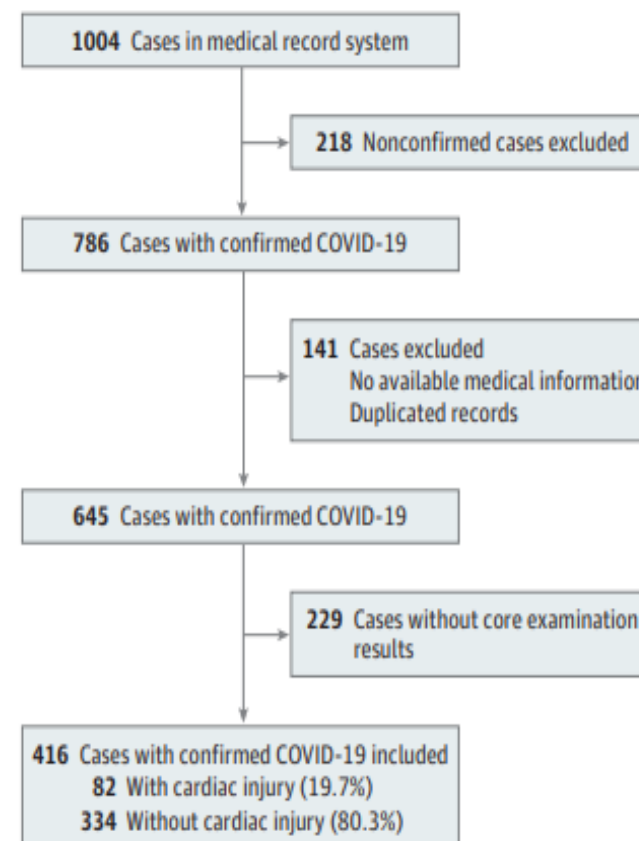
OBJECTIVE To explore the association between cardiac injury and mortality in patients with COVID-19.

DESIGN, SETTING, AND PARTICIPANTS This cohort study was conducted from January 20, 2020, to February 10, 2020, in a single center at Renmin Hospital of Wuhan University, Wuhan, China; the final date of follow-up was February 15, 2020. All consecutive inpatients with laboratory-confirmed COVID-19 were included in this study.

MAIN OUTCOMES AND MEASURES Clinical laboratory, radiological, and treatment data were collected and analyzed. Outcomes of patients with and without cardiac injury were compared. The association between cardiac injury and mortality was analyzed.

- ← Editorial page 751
- ← Related articles pages 811, 819, and 831
- + Supplemental content

Figure 1. Flowchart of Patient Recruitment



ORIGINAL RESEARCH

Cardiac Involvement in Patients Recovered From COVID-2019 Identified Using Magnetic Resonance Imaging



Lu Huang, MD, PhD,^{a,*} Peijun Zhao, MD,^{a,*} Dazhong Tang, MS,^a Tong Zhu, MD,^a Rui Han, MD,^b Chenao Zhan, MD, PhD,^a Weiyong Liu, MD, PhD,^c Hesong Zeng, MD, PhD,^d Qian Tao, PhD,^e Liming Xia, MD, PhD^a

ABSTRACT

OBJECTIVES This study evaluated cardiac involvement in patients recovered from coronavirus disease-2019 (COVID-19) using cardiac magnetic resonance (CMR).

BACKGROUND Myocardial injury caused by COVID-19 was previously reported in hospitalized patients. It is unknown if there is sustained cardiac involvement after patients' recovery from COVID-19.

METHODS Twenty-six patients recovered from COVID-19 who reported cardiac symptoms and underwent CMR examinations were retrospectively included. CMR protocols consisted of conventional sequences (cine, T2-weighted imaging, and late gadolinium enhancement [LGE]) and quantitative mapping sequences (T1, T2, and extracellular volume [ECV] mapping). Edema ratio and LGE were assessed in post-COVID-19 patients. Cardiac function, native T1/T2, and ECV were quantitatively evaluated and compared with controls.

RESULTS Fifteen patients (58%) had abnormal CMR findings on conventional CMR sequences: myocardial edema was found in 14 (54%) patients and LGE was found in 8 (31%) patients. Decreased right ventricle functional parameters including ejection fraction, cardiac index, and stroke volume/body surface area were found in patients with positive conventional CMR findings. Using quantitative mapping, global native T1, T2, and ECV were all found to be significantly elevated in patients with positive conventional CMR findings, compared with patients without positive findings and controls (median [interquartile range]: native T1 1,271 ms [1,243 to 1,298 ms] vs. 1,237 ms [1,216 to 1,262 ms] vs. 1,224 ms [1,217 to 1,245 ms]; mean \pm SD: T2 42.7 \pm 3.1 ms vs. 38.1 ms \pm 2.4 vs. 39.1 ms \pm 3.1; median [interquartile range]: 28.2% [24.8% to 36.2%] vs. 24.8% [23.1% to 25.4%] vs. 23.7% [22.2% to 25.2%]; $p = 0.002$; $p < 0.001$, and $p = 0.002$, respectively).

CONCLUSIONS Cardiac involvement was found in a proportion of patients recovered from COVID-19. CMR manifestation included myocardial edema, fibrosis, and impaired right ventricle function. Attention should be paid to the possible myocardial involvement in patients recovered from COVID-19 with cardiac symptoms.

(J Am Coll Cardiol Img 2020;13:2330-9) © 2020 by the American College of Cardiology Foundation.

- COVID-19'dan iyileşen ancak kardiyak semptomlar bildiren 26 hastanın CMR incelenmesi.
- 26 hastanın hiçbiri COVID-19'dan önce bilinen kardiyak öyküsü yok. Ancak 26 hastanın 15'inde miyokardiyal ödem ve/veya odak LGE lezyonu görüldü.
- Sağlıklı kişilerde miyokardiyal doku anormalliklerinin varlığı, SARS-CoV-2 enfeksiyonunun kalıcı bir sonucu olarak kardiyak tutulumu düşündürür

ORIGINAL RESEARCH

Cardiac Involvement in Patients Recovered From COVID-2019 Identified Using Magnetic Resonance Imaging



Lu Huang, MD, PhD,^{2,*} Peijun Zhao, MD,^{3,*} Dazhong Tang, MS,³ Tong Zhu, MD,³ Rui Han, MD,^b Chenao Zhan, MD, PhD,³ Weiyong Liu, MD, PhD,^c Hesong Zeng, MD, PhD,^d Qian Tao, PhD,^e Liming Xia, MD, PhD^a

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BACKGROUND Myocardial injury caused by COVID-19 was previously reported in hospitalized patients. It is unknown if there is sustained cardiac involvement after patients' recovery from COVID-19.

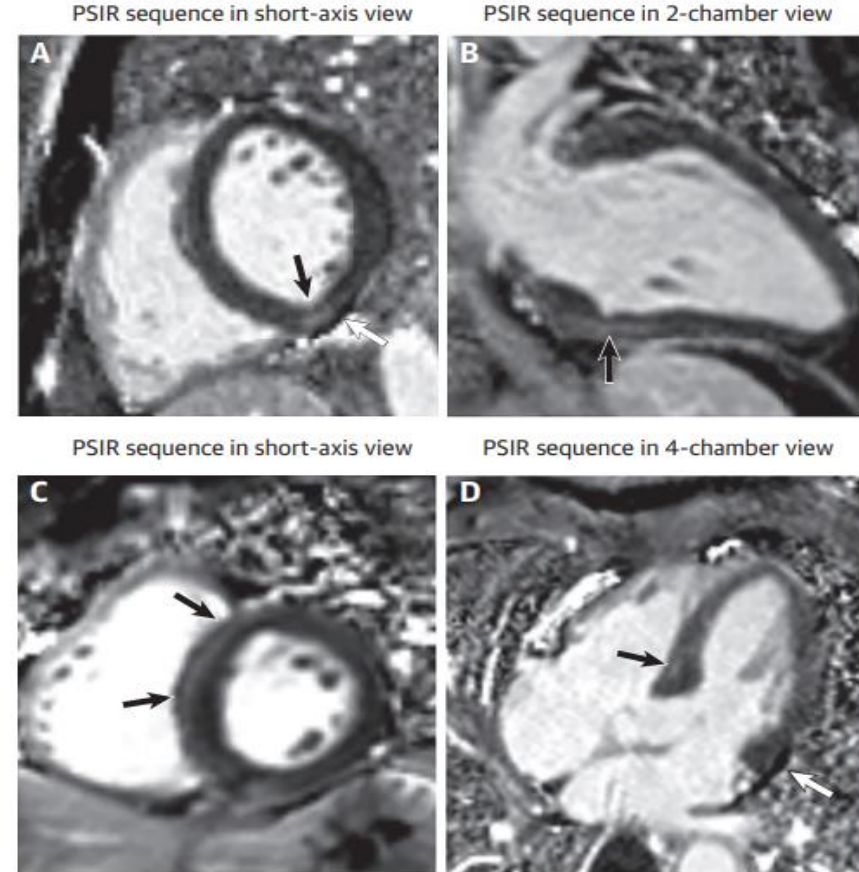
METHODS Twenty-six patients recovered from COVID-19 who reported cardiac symptoms and underwent CMR examinations were retrospectively included. CMR protocols consisted of conventional sequences (cine, T2-weighted imaging, and late gadolinium enhancement [LGE]) and quantitative mapping sequences (T1, T2, and extracellular volume [ECV] mapping). Edema ratio and LGE were assessed in post-COVID-19 patients. Cardiac function, native T1/T2, and ECV were quantitatively evaluated and compared with controls.

RESULTS Fifteen patients (58%) had abnormal CMR findings on conventional CMR sequences: myocardial edema was found in 14 (54%) patients and LGE was found in 8 (31%) patients. Decreased right ventricle functional parameters including ejection fraction, cardiac index, and stroke volume/body surface area were found in patients with positive conventional CMR findings. Using quantitative mapping, global native T1, T2, and ECV were all found to be significantly elevated in patients with positive conventional CMR findings, compared with patients without positive findings and controls (median [interquartile range]: native T1 1,271 ms [1,243 to 1,298 ms] vs. 1,237 ms [1,216 to 1,262 ms] vs. 1,224 ms [1,217 to 1,245 ms]; mean \pm SD: T2 42.7 \pm 3.1 ms vs. 38.1 ms \pm 2.4 vs. 39.1 ms \pm 3.1; median [interquartile range]: 28.2% [24.8% to 36.2%] vs. 24.8% [23.1% to 25.4%] vs. 23.7% [22.2% to 25.2%]; $p = 0.002$; $p < 0.001$, and $p = 0.002$, respectively).

CONCLUSIONS Cardiac involvement was found in a proportion of patients recovered from COVID-19. CMR manifestation included myocardial edema, fibrosis, and impaired right ventricle function. Attention should be paid to the possible myocardial involvement in patients recovered from COVID-19 with cardiac symptoms.

(J Am Coll Cardiol Img 2020;13:2330-9) © 2020 by the American College of Cardiology Foundation.

FIGURE 1 Focal Myocardial Fibrosis in Patients Recovered From COVID-19



A 29-year-old male patient (**first row**) underwent cardiac CMR 1 month after the onset of palpitations. A 60-year-old male patient (**second row**) underwent cardiac CMR 2 months after the onset of palpitations. PSIR sequences in short-axis view (**A, C**) showed focal LGE (**black arrows**) in inferior and septal segments of left ventricle, respectively. Results were confirmed on the PSIR sequences in 2-chamber view (**C**) and 4-chamber view (**D**). Images **A** and **D** demonstrated a small pericardial effusion (**white arrow**) in both patients. COVID-19 = coronavirus disease-2019; CMR = cardiac magnetic resonance; LGE = late gadolinium enhancement; PSIR = phase-sensitive inversion recovery.

JAMA Cardiology

American Medical Association

THIS ARTICLE HAS BEEN CORRECTED.

See *JAMA Cardiol.* 2021 January; 6(1): 123.

Cardiovascular Magnetic Resonance Findings in Competitive Athletes Recovering From COVID-19 Infection

Saurabh Rajpal, MBBS, MD, Matthew S. Tong, DO, [...],
and Curt J. Daniels, MD

- 26 sporcudan 4'ünde (%15) miyokarditi düşündüren CMR bulguları vardı ve ek 8 sporcuda (%30.8) önceki miyokard yaralanmasını düşündüren T2 yükselmesi olmaksızın LGE sergiledi.



Miyokardiyal hasar, sol ventrikül duvarının hipertrofisini ve fibrozisini içeren, kontraktilitenin azalmasına ve global fonksiyonun bozulmasına yol açan bir yeniden şekillenme sürecidir , ana profibrotik sitokin olarak TGF- β önemli bir oyuncudur.



COVID 19'un uzun vadeli kardiyak sonuçlarını tahmin etmek için belki de çok erken olsa da, SARS-CoV-1 ve SARS-CoV-2 arasındaki genetik benzerlikler göz önüne alındığında, SARS-CoV-1 hastaları ile 12 yılda %40'ında kardiyovasküler anormallikler saptandı.

- Biernacka A, Frangogiannis NG (2011) Aging and Cardiac Fibrosis. *Aging Dis* 2(2):158–173.
- Wu Q, Zhou L, Sun X (2017) Altered lipid metabolism in recovered SARS patients twelve years after infection. *Sci Rep* 7:9110



Koagülopati

- Şiddetli COVID-19 enfeksiyonu olan hastalarda, ani pıhtılaşma aktivasyonu ve pıhtılaşma faktörlerinin tüketimi ile DIC benzeri bir koagülopati gelişir.
- Bu, pıhtılaşma zamanının uzaması (PT ve aPTT), düşük trombosit sayısı ve tüketime bağlı olarak azalmış fibrinojen (< 1.0 g/L) ile karakterizedir.



COVID-19 and its implications for thrombosis and anticoagulation

Jean M. Connors¹ and Jerrold H. Levy^{2,4}

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Table 1. COVID-19–associated coagulopathy

Summary of findings
1. Coagulopathy is manifest as elevated fibrinogen, elevated D-dimers, and minimal change in PT, aPTT, and platelet count in early stages of infection
2. Increasing IL-6 levels are correlated with increasing fibrinogen levels
3. Coagulopathy appears to be related to severity of illness and resultant thromboinflammation and not intrinsic viral activity
4. Elevated D-dimer at admission is associated with increased mortality
5. Rising D-dimer after admission precedes multiorgan failure and overt DIC <ol style="list-style-type: none">Noted to start at 4 d after admission in nonsurvivorsLonger duration of hospital stay associated with increasing D-dimer and development of sepsis physiology
6. Bleeding manifestations are not common despite coagulopathy

July 20, 2020

Thrombosis in Hospitalized Patients With COVID-19 in a New York City Health System

Seda Bilaloglu, MS¹; Yin Aphinyanaphongs, MD, PhD¹; Simon Jones, PhD, MSc¹; [et al](#)

» [Author Affiliations](#) | [Article Information](#)

JAMA. 2020;324(8):799-801. doi:10.1001/jama.2020.13372

- 829 yoğun bakım hastasının %29,4'ünde tromboembolik olay (%13,6 venöz - %18,6 arteriyel)
- Yoğun bakım ihtiyacı olmayan 2505 hastanın %11,5'inde tromboembolik olay (%3,6 venöz- %8,4 arteriyel)



Contents lists available at ScienceDirect

Thrombosis Research

journal homepage: www.elsevier.com/locate/thromres



Full Length Article

Venous and arterial thromboembolic complications in COVID-19 patients admitted to an academic hospital in Milan, Italy

Corrado Lodigiani^{a,b,*}, Giacomo Iapichino^c, Luca Carenzo^c, Maurizio Cecconi^{b,c}, Paola Ferrazzi^a, Tim Sebastian^d, Nils Kucher^d, Jan-Dirk Studt^e, Clara Sacco^a, Bertuzzi Alexia^f, Maria Teresa Sandri^g, Stefano Barco^{d,h}, on behalf of the Humanitas COVID-19 Task Force

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Review

COVID-19: Coagulopathy, Risk of Thrombosis, and the Rationale for Anticoagulation

Wolfgang Miesbach, MD¹ and Michael Makris, MD^{2,3}

Abstract

The novel coronavirus infection (COVID-19) is caused by the new coronavirus SARS-CoV-2 and is characterized by an exaggerated inflammatory response that can lead to severe manifestations such as adult respiratory syndrome, sepsis, coagulopathy, and death in a proportion of patients. Among other factors and direct viral effects, the increase in the vasoconstrictor angiotensin II, the decrease in the vasodilator angiotensin, and the sepsis-induced release of cytokines can trigger a coagulopathy in COVID-19. A coagulopathy has been reported in up to 50% of patients with severe COVID-19 manifestations. An increase in D-dimer is the most significant change in coagulation parameters in severe COVID-19 patients, and progressively increasing values can be used as a prognostic parameter indicating a worse outcome. Limited data suggest a high incidence of deep vein thrombosis and pulmonary embolism in up to 40% of patients, despite the use of a standard dose of low-molecular-weight heparin (LMWH) in most cases. In addition, pulmonary microvascular thrombosis has been reported and may play a role in progressive lung failure. Prophylactic LMWH has been recommended by the International Society on Thrombosis and Haemostasis (ISTH) and the American Society of Hematology (ASH), but the best effective dosage is uncertain. Adapted to the individual risk of thrombosis and the D-dimer value, higher doses can be considered, especially since bleeding events in COVID-19 are rare. Besides the anticoagulant effect of LMWH, nonanticoagulant properties such as the reduction in interleukin 6 release have been shown to improve the complex picture of coagulopathy in patients with COVID-19.

Keywords

COVID-19, thrombosis, anticoagulation

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journal homepage: www.jcvaonline.com



Editorial
Anesthetic Considerations for Recovered COVID-19
Patients



COVID-19 hastaları, antikoagülanların uygulanmasıyla ilave kafa içi kanama olasılığı ile birlikte iskemik veya hemorajik intrakraniyal patoloji yaşayabilir.

- Önceki merkezi sinir sisteminin titiz bir incelemesi intrakraniyal kanama riskini en aza indirmek için antikoagülasyon veya trombolitik tedavi gerektiren işlemlerden önce sistem görüntülemesi yapılmalıdır.

PRACTICAL PEARL

Catastrophic Intracranial Hemorrhage in Two Critically Ill Patients with COVID-19

Elizabeth Carroll¹ and Ariane Lewis^{1,2}

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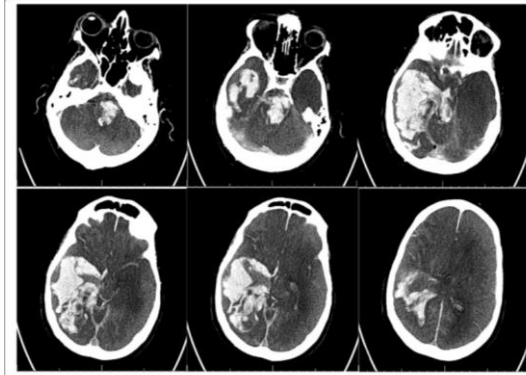


Fig. 2 Patient #2 NCHCT, NOCHT obtained on HD #17, demonstrating large intraparenchymal hemorrhage in the right temporal, occipital, and parietal lobes with intraventricular extension, and a large brainstem hemorrhage, with diffuse cerebral edema and evidence of global anoxic injury and impending herniation

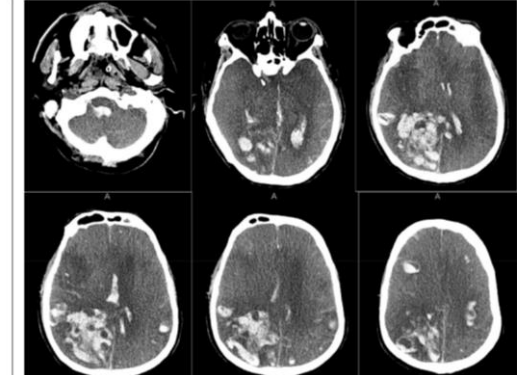


Fig. 3 Patient #1 NCHCT, NOCHT obtained on HD #13, demonstrating multifocal intraparenchymal hemorrhage with intraventricular extension, mass effect, and evidence of global anoxic injury, cerebral edema, and downward herniation of the cerebellar tonsils

- İnme, kafa içi kanama ve uzun süreli entübasyon ve hareketsizliğe bağlı kritik hastalık miyopatisi dahil olmak üzere COVID-19 ile ilgili nörolojik belirtiler, iyileşen COVID-19 hastalarında dikkate alınması gereken önemli hususlardır.



Contents lists available at [ScienceDirect](#)

International Journal of Infectious Diseases

journal homepage: www.elsevier.com/locate/ijid



Case Report

Critical illness myopathy after COVID-19

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ABSTRACT

This paper describes a patient who developed diffuse and symmetrical muscle weakness after a long stay in the intensive care unit (ICU) due to coronavirus disease 2019 (COVID-19). The patient underwent a neurophysiological protocol, including nerve conduction studies, concentric needle electromyography (EMG) of the proximal and distal muscles, and direct muscle stimulation (DMS). Nerve conduction studies showed normal sensory conduction and low-amplitude compound muscle action potentials (CMAPs). EMG revealed signs of myopathy, which were more pronounced in the lower limbs. The post-DMS CMAP was absent in the quadriceps and of reduced amplitude in the tibialis anterior muscle. Based on these clinical and neurophysiological findings, a diagnosis of critical illness myopathy was made according to the current diagnostic criteria. Given the large number of patients with COVID-19 who require long ICU stays, many are very likely to develop ICU-acquired weakness, as did the patient described here. Health systems must plan to provide adequate access to rehabilitative facilities for both pulmonary and motor rehabilitative treatment after COVID-19.

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- Uzun süreli yoğun bakım ihtiyacı nedeniyle hastalarda miyopati riski artmaktadır.
- Uzun yoğun bakım ünitesinde kaldıktan sonra ameliyat için başvuran hastalarda, rabdomiyoliz ve hiperkalemi riskini azaltmak için süksinilkolin kullanımından kaçınmak ihtiyatlı olabilir.

Kortikosteroid

JAMA | [Original Investigation](#) | CARING FOR THE CRITICALLY ILL PATIENT

Effect of Dexamethasone on Days Alive and Ventilator-Free in Patients With Moderate or Severe Acute Respiratory Distress Syndrome and COVID-19 The CoDEX Randomized Clinical Trial

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- COVID 19 ile ilişkili akut respiratuar distres sendromu için kortikosteroid kullanımı üzerine yapılan çok sayıda çalışma, mortalite yararı olduğunu öne sürmüştür.

Research

JAMA | Original Investigation | CARING FOR THE CRITICALLY ILL PATIENT

Effect of Hydrocortisone on Mortality and Organ Support in Patients With Severe COVID-19

The REMAP-CAP COVID-19 Corticosteroid Domain Randomized Clinical Trial

The Writing Committee for the REMAP-CAP Investigators

Key Points

Question Does intravenous hydrocortisone, administered either as a 7-day fixed-dose course or restricted to when shock is clinically evident, improve 21-day organ support-free days (a composite end point of in-hospital mortality and the duration of intensive care unit-based respiratory or cardiovascular support) in patients with severe coronavirus disease 2019 (COVID-19)?

Findings In this bayesian randomized clinical trial that included 403 patients and was stopped early after results from another trial were released, treatment with a 7-day fixed-dose course of hydrocortisone or shock-dependent dosing of hydrocortisone, compared with no hydrocortisone, resulted in 93% and 80% probabilities of superiority, respectively, with regard to the odds of improvement in organ support-free days within 21 days.

Meaning Although suggestive of benefit for hydrocortisone in patients with severe COVID-19, the trial was stopped early and no treatment strategy met prespecified criteria for statistical superiority, precluding definitive conclusions.

- Kortikosteroid dozları, en az yedi günlük süreçte her altı saatte bir 50 mg hidrokortizon ile günde 20 mg deksametazon arasında değişmektedir.

Jerrold H. Levy, M.D., F.A.H.A., F.C.C.M., Editor

Perioperative Steroid Management

Approaches Based on Current Evidence

Melanie M. Liu, M.D., Andrea B. Reidy, M.D., Siavosh Saatee, M.D., Charles D. Collard, M.D.

Amerikan Anesteziyologlar Derneđi kılavuz üç veya daha fazla hafta boyunca günde 20 mg prednizon dozunun hipotalamik-hipofiz adrenal eksen baskılanmasına yeterli olabileceđini düşündürmektedir.

Majör cerrahi için anestezi uygulanan veya ekstremiste cerrahi uygulanan hastalarda adrenal supresyona neden olabilir.

Steroid tedavisi alma olasılıđının yüksek olması nedeniyle, klinisyenler, diđer kalıcı hipotansiyon nedenleri ekarte edilirse, COVID-19'dan iyileşen hastalarda stres dozu kortikosteroidlerinin (100 mg hidrokortizon ve ardından her altı saatte bir 50 mg) kullanımını düşünmelidir.



- Son olarak, COVID-19'dan iyileşen birçok hasta, uzun süreli hastanede yatışla ilişkili travma sonrası stres bozukluğu yaşayabilir;
- Bunu kabul etmek ve hastaların anestezi uzmanları veya psikiyatri uzmanları tarafından ne gibi endişeleri olabileceğini anlamak ve kaygıyı azaltmak çok önemlidir.



• *Teşekkürler...*