

Autopsy findings in SARS-CoV-2 “molecular healing”

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INTRODUCTION: Data on histopathological changes in autopsied patients who eradicated severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) are very limited.

OBJECTIVES: Here we reported the autopsies of 3 patients who died after 55, 51 and 36 days (long-term hospitalization) with diagnosis of SARS-CoV-2 related pneumonia at Bellaria Hospital, and at Policlinico S.Orsola-Malpighi, Bologna, Italy.

Patient 1 died in the first pandemic wave (spring 2020). Patient 2 and 3 died in the second and third pandemic waves (winter-spring 2021).

During this long-time hospitalization nasopharyngeal swab turned negative.

Microscopic examination showed pathological changes in several organs, especially lungs, heart and brain.

SARS-CoV-2 RNA was not detected by PCR in all post-mortem tissues tested.

MATERIALS AND METHODS:

• *Study setting and data collection*

• *Histopathological examinations*

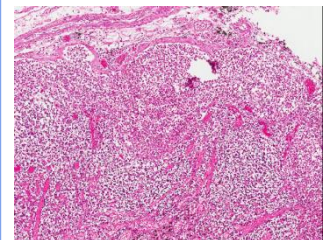
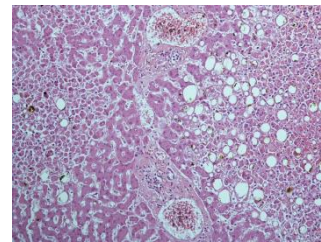
• *Microbiological analysis: SARS-CoV-2 RNA was searched on 10 micron tissue sections. Extraction of nucleic acids, reverse transcription reaction and real-time PCR amplification were performed using SARS-CoV-2 ELITE MGB® Kit (ELITechGroup, Italy) on ELITeInGenius® instrument. The assay detects the RNA of two SARS-CoV-2 specific genomic regions: RdRp gene and ORF8 gene.*

RESULTS:

	Case 1 (*)	Case 2 (**)	Case 3 (***)
Gender	M	M	M
Age	58	75	58
Hospitalization (days)	51	36	55
Associated Pathologies	Hypertension	Hypertension	Epilepsy Oligophrenia Stroke
Other findings	<i>E. faecium</i> <i>S. capitis</i> <i>P. aeruginosa</i> Anemia Pulmonary embolism	<i>S. epidermidis</i> <i>S. pneumoniae</i>	
Cause of death	COVID related pneumonia <i>P. aeruginosa</i> related pneumonia Pulmonary embolism Focal myocarditis Atherosclerosis Meningitis	COVID related pneumonia	COVID related pneumonia Bronchopneumonia

LIVER

Hepatic portal tract microthrombi (*)



LYMPHNODES

Lymphoid depletion and erythrophagocytosis (*)

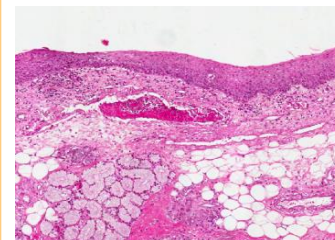
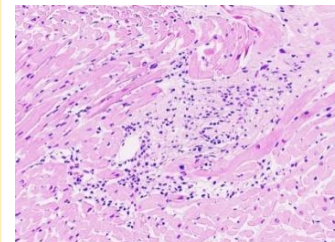
HEART

Myocardial sclerosis (*, **, ***)

Myocarditis (*)

Right ventricle dilatation with slight hypertrophy (**, ***)

Acute Myocardial Infarction (**)



TONGUE

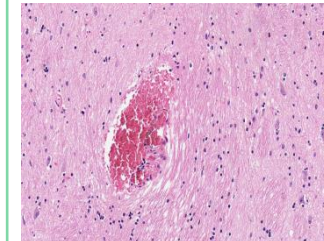
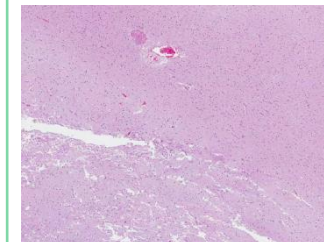
Microthrombi (*)

BRAIN

Oedema (*, **, ***)

Small blood vessels ectasia, perivascular oedema, perivascular micro-hemorrhages, hemosiderin-laden macrophages, micro-infarcts (*, **, ***)

Leptomeningeal purulent accumulation and focal subarachnoid hemorrhage (*)



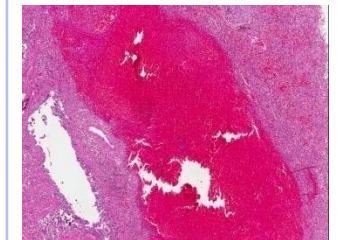
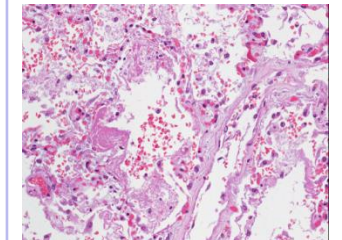
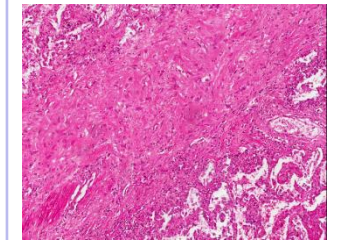
PANCREAS

Peripancreatic adipose tissue microthrombi (*)

LUNGS

Dense fibrous tissue deposition and acute DAD (*, **, ***)

P. aeruginosa pneumonia (*)



CONCLUSIONS: Our autopsic cases showed that SARS-COV 2 related illness is not only a pneumonia but a very complicated systemic disease. Despite the viral eradication, organs damages an aggressive clinical course can occur also in the late stage of the disease. In addition, prospective studies are needed to investigate potential correlations between acute, sub-acute, chronic COVID-19 infections and long-term consequences. Rehabilitation care after hospitalization will require an adequate multidisciplinary follow-up.