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MORPHOLOGICAL CHANGES IN THE LIVER DUE TO THE COVID-19 INFECTION

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COVID-19 is a contagious disease caused by the coronavirus SARS-CoV-2, first identified in late 2019. It is associated with a range of systemic pathological changes, predominantly including liver pathology. This study aims to elaborate on the specific morphological changes observed in the liver of patients infected with COVID-19, based on reviewing observations found in live biopsies and autopsy evaluations.

Grossly, the liver has a congested appearance of varying degrees of yellow color. One of the main morphological changes observed was mild to moderate steatosis, both microvesicular and macrovesicular, with the latter being predominant. It is a condition characterized by the accumulation of fat droplets in the liver cells because COVID-19 tends to cause increased cytokine production disrupting lipid metabolism, whilst also correlated with antiviral and mechanical ventilation interventions. Portal inflammation was observed, which is an inflammatory process that occurs in the portal triads of the liver and tends to cause liver dysfunction. In Covid-19 there is a systemic inflammatory response triggered by the release of cytokines which can lead to this. It is associated with a slight increase of portal mononuclear cells which includes the portal macrophages, lymphocytes and plasma cells, without eosinophils and neutrophils. Mild to severe forms of lobular inflammation was also present related to localized inflammatory response of the body and elevated levels of cytokines. Fibrosis of hepatocytes and the vascular wall, having the same etiology as that of the elevated liver enzyme levels, leads to impairment of blood flow causing portal hypertension. Moderate to severe forms of multifocal and diffuse hepatic necrosis, including centrilobular necrosis and bridging necrosis were found. Vascular changes manifested as portal vein dilation and in some cases, herniation of the portal veins into the periportal hepatocytes. Vascular pathologies include phlebosclerosis, Veno-occlusive diseases, muscular hyperplasia and hyalinosis. Three forms of granulomas are found to be associated with COVID-19; fibrin ring shaped portal and lobular granuloma, multiple necrotizing granuloma and non-necrotizing granuloma.

Conclusively, the morphological changes mentioned reflect the ability of the virus to induce significant liver damage. However, as this is a relatively new area of research, the prevailing question still exists; does the virus have direct cytopathic effects on the hepatocytes or whether its impact is mediated through virus-associated complications?