# بسم الله الرحمن الرحيم


MONA MAGHRABY

# شبكة المعلومات الجامعية

# التوثيق الالكتروني والميكروفيلم

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# جامعة عين شمس

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# قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات

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تحفظ هذه الأقراص المدمجة بعيدا عن الغبار

***MONA MAGHRABY***

# The Time Course of Lung Changes on Chest CT during Recovery Coronavirus (COVID-19) Pneumonia

Thesis

*Submitted for Partial Fulfillment of*
*Master Degree in* ***Radiology***

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# List of Abbreviations

| Abb. | Full term |
|---|---|
| 2D | Two-dimensional |
| 3D | Three-dimensional |
| AFOP | Acute Fibrinous and Organizing Pneumonia |
| ARDS | Acute Respiratory Distress Syndrome |
| B/A | Bronchoarterial |
| BI | Bronchus intermedius |
| CDC | Control and Prevention Center |
| CT | Computed tomography |
| FOV | Field of view |
| GGO | Ground glass opacity |
| HU | Hounsfield units |
| kV | Kilovolt |
| LMB | Left main bronchus |
| mA | Milliampere |
| mAs | Milliampere seconds |
| MDCT | Multidetector helical computed tomography |
| MD-HRCT | Multidetector helical HRCT |
| mGy | Milligray |
| MinIP | Minimum-intensity projection |
| MIP | Maximum-intensity projection |
| mSv | Millisievert |
| NSIP | Nonspecific interstitial pneumonia |
| RMB | Right main bronchus |
| ROI | Region of interest |
| T/D | Bronchial wall thickness/diameter |

# INTRODUCTION

At the end of 2019, 27 cases of pneumonia of unknown origin were identified in the city of Wuhan, China. The causative agent of this disease was identified from nasopharyngeal swab samples by the Centers for Disease Control and Prevention (CDC), on January 7, 2020; it was called severe acute respiratory syndrome coronavirus type 2 (SARS-CoV-2). The disease was named COVID-19 by the World Health Organization ***(Jin et al., 2020).***

At the moment, the diagnosis is based on clinical findings, the patient's epidemiological history, findings on chest computed tomography (CT), and reverse transcriptase polymerase chain reaction (RT-PCR), the last being the "gold standard" ***(Tahamtan et al., 2020).***

In the current COVID-19 pandemic, radiology plays a fundamental role in patient management. Chest CT is a non-invasive radiological examination that involves the use of X-rays at different angles around the patient's chest to produce cross sectional images ***(Hope et al., 2020).***

As COVID-19 spreads across the world, there is increasing interest in the role of chest CT in screening, diagnosis, and management of patients with suspected or confirmed COVID-19 infection. The American College of Radiology recommends that chest CT should be used with

discretion and reserved for hospitalized and symptomatic patients with specific clinical indications for CT. Likewise; it indicates that it should not be used as a first line diagnostic test ***(Yang et al., 2020).***

Chest CT is used to assess the severity of the lung affected by COVID-19. However, in some situations such as a shortage of RT-PCR tests in emergency situations, it can be considered as a diagnostic option. This is because it provides, at initial stages, a higher sensitivity to molecular tests also due to the speed with which the images are obtained, and thus reduce the false negative rate. With this benefit, the appropriate isolation measures can be taken as well as applying the appropriate management ***(Lu et al., 2020).***

The purpose of this study is detecting the change in chest CT findings associated with COVID-19 pneumonia from initial diagnosis until patient recovery with the aim of proper recognition of the radiological changes during the course of the disease & determining the proper interval for CT repetition.