

Case Report

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Per oral endoscopic myotomy (POEM) in a COVID-19 patient**Shaimaa Elkholy¹; Kareem Essam¹; Ahmed Ragab El-Gazzarah²; Gina Gamal³; Abeer Awad Abdellatif^{*}; Mohamed El-Sherbiny¹**¹Gastroenterology Division, Internal Medicine Department, Faculty of Medicine, Cairo University, Egypt.²Tropical Medicine Department, Faculty of Medicine, Menoufia University, Egypt.³Gastroenterology Division, Internal Medicine Department, Faculty of Medicine, Ain Shams University, Egypt.***Corresponding Author: Abeer Awad Abdellatif**Internal Medicine Department, Kasr Al-Aini Hospitals,
Cairo University, Cairo Egypt
Tel: +20-100-277-6494; Email: beero4a@yahoo.com**Abstract**

Background: SARS-COV2 pandemic had a great impact on our life. Changes had been done to accommodate the current situation. Infection control measures in the endoscopy units had entirely changed. Also, prioritizations of different procedures had changed especially in the lockdown time. Peroral Endoscopic Myotomy (POEM) is considered a low priority endoscopic procedure.

Case presentation: We report a 12-year-old child complaining of dysphagia and weight loss who was diagnosed as Type II achalasia. She underwent POEM. According to our Egyptian protocol; COVID-19 was excluded pre-procedural. After POEM, immediately post-procedural chest X-ray was done as usual, and it showed a shadow in the right lung base. Accordingly, HRCT of the chest was done and it showed bilateral asymmetrical patchy areas of ground-glass opacities in the posterior segments of both lower lung lobes (CO-RADS 4). PCR for COVID-19 was positive.

Conclusion: We report a very unique COVID-19 case that raises many challengeable issues and shows a useful message about the risk of silent COVID-19 infection in children during the endoscopy.

Keywords: achalasia; Poem; 3rd Space endoscopy; COVID-19.**Background**

The risk of transmission of Coronavirus-19 (COVID-19) during endoscopy seems to be a challenging issue due to the unavoidable risk of exposure to respiratory secretions and/or feces during the procedure, also asymptomatic COVID-19 infected patients may add another obstacle for infection transmission. A lot of societies exert hugely efforts to minimize this risk through patient triage and risk assessment before endoscopy, resource prioritization, and allocation, regular monitoring of personal

protective equipment, infection control measures, protective device training, and implementation of a strategy for a stepwise resumption of endoscopy services after control of the COVID-19 outbreak [1]. Therefore, the benefit of endoscopy should be weighted by the risk of COVID-19 infection to them; therefore prioritizations of different procedures had changed especially in the lockdown time.

According to the European Society of Gastrointestinal Endoscopy (ESGE) position statement, Peroral Endoscopic Myotomy (POEM) is considered a low priority endoscopic procedure [2].

Case presentation

We present a 12-year-old child complaining of dysphagia and weight loss of 10 months duration. Her condition had recently worsened when she started to develop recurrent attacks of vomiting. She was diagnosed to have type II achalasia (Figure 1).

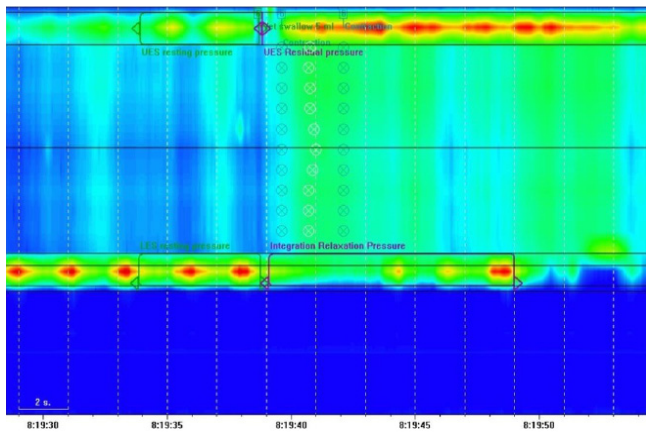


Figure 1: High resolution manometry showing type II achalasia with pan pressurization and high IRP=34.2 and LES resting pressure=51 mmHg.

The patient was referred to our center for POEM. According to our hospital's protocol, prior to admission HRCT scan of the chest, CBC and CRP are routinely done. Our patient had normal results of the HRCT (Figure 2a), CRP was negative, and CBC was normal apart from relative lymphocytosis (2 days before the procedure). The patient had also serological tests for COVID-19; IgG was positive while IgM was negative. The patient was then admitted to our hospital and POEM procedure was done under general anesthesia and mechanical ventilation (Figure 3 shows steps of POEM procedure) [Supplementary Video]. Chest X-ray was done immediately after the procedure as usual; a shadow was seen in the right lung base. HRCT of the chest was done for fear of aspiration pneumonia and the results were shocking. It showed bilateral asymmetrical patchy areas of ground-glass opacities in the posterior segments of both lower lung lobes but more extensive on the right side and scattered fluffy cotton opacities (CO-RADS 4) [Figure 2b]. A Real-Time Polymerase Chain Reaction (RT-PCR) assay for COVID-19 was done and it was positive. No one from the Health Care Workers (HCW) or her family members who come in close contact develop any symptoms suggestive of COVID-19 infection, however; no screening for COVID-19 infection was done for them.

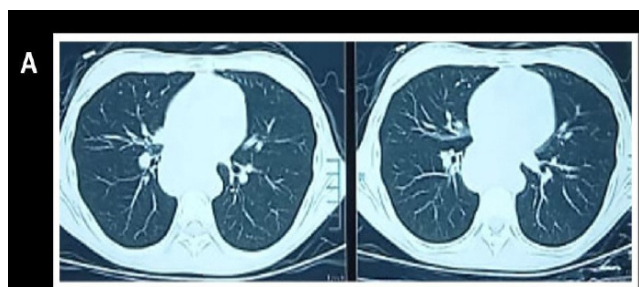


Figure 2a: HRCT scan of the chest pre and post POEM. Completely free scan of the Chest 2 days before POEM.

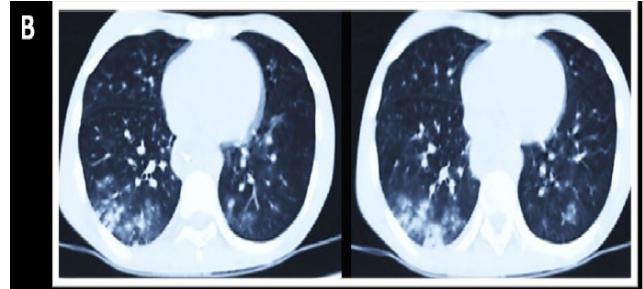


Figure 2b: Bilateral asymmetrical patchy areas of ground glass opacities in the posterior segments of both lower lung lobes but more extensive on the right side and scattered fluffy cotton opacities (CO-RADS 4), highly impressive of COVID-19 with CT severity of 10/25 (Moderate stage).

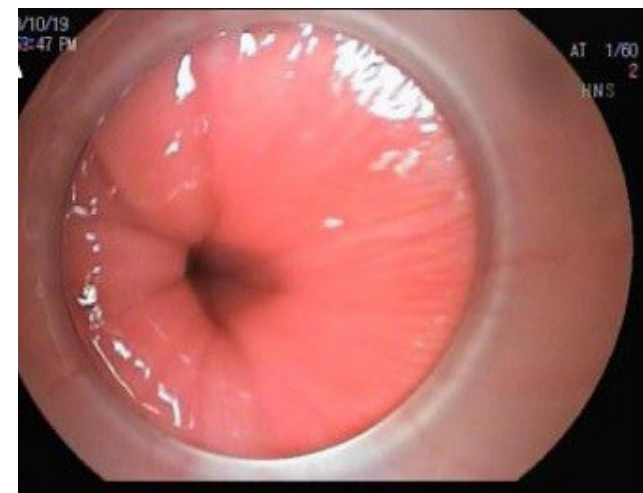


Figure 3: Images showing the steps of POEM; A1-Tight cardia.



Figure 3A2: Creation of the tunnel opening.

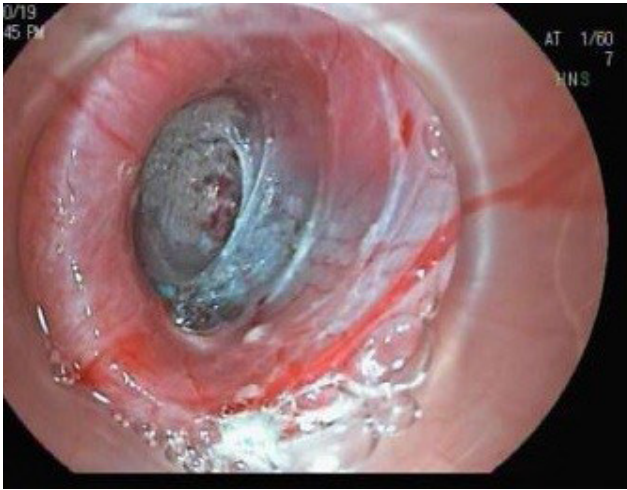


Figure 3A3: Dissection below the cardia.

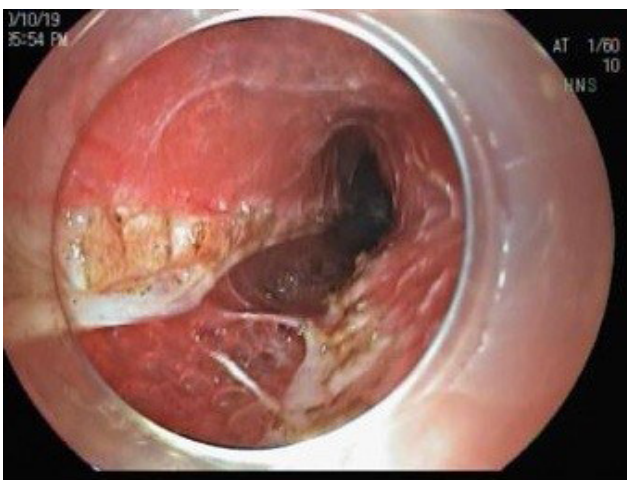


Figure 3A4: Myotomy completed.

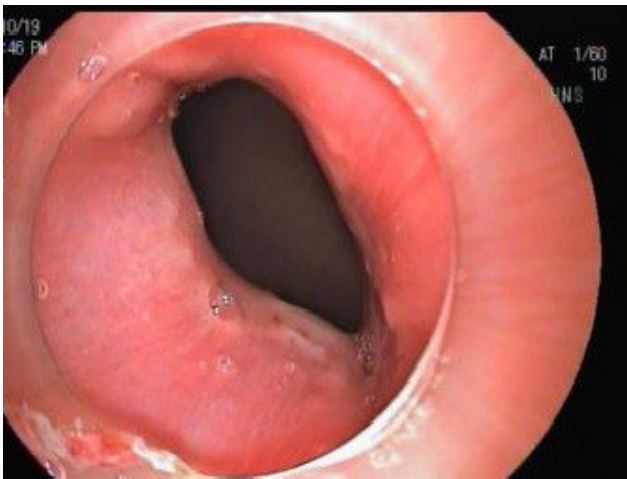


Figure 3A5: Wide cardia.

Discussion

In Egypt, the lockdown had been ended 3 months ago and endoscopic procedures were gradually returned to the usual practice but with different precautions. Currently, despite all precautions that are taken to minimize the risk of COVID-19 transmission during the endoscopy theater; there are still many challengeable issues. Furthermore, asymptomatic COVID-19 infected patients are a recognized source for transmission of

infection [3]; the various available data reported that the viral loads detected in asymptomatic patients are similar to those of symptomatic patients, indicating that infection could be transmitted from asymptomatic as similar to symptomatic individuals [4]. Accordingly, the effective prevention and control for apparent infection is early detection and early isolation. Meanwhile, the prevention and control for silent infection is overall isolation and overall disinfection [5].

Some societies recommend testing all patients having an endoscopy of longer than an hour, highlighting the increased risk of infection with prolonged aerosol generation [6].

Based on increasing the risk of coughing and aerosol generation during the long procedures, the risk of endotracheal intubation and mechanical ventilation may be another risk for infection transmission.

In our case and after exclusion of COVID-19 infection according to our national guide [7]; the endoscopic procedure was done, which was followed immediately by typical CT findings of COVID-19 infection.

However, COVID-19 infection seems to be rare and mild in children, with only 2.4% of reported cases occurring in individuals below 19 years old with approximately 2.5% and 0.2% who developed severe and critical illness respectively [8,9]; still, the reason for the lower burden of COVID-19 infection in children is not clear. It could be explained by a lower expression of Angiotensin-Converting Enzyme 2 (ACE2), a receptor for the SARS-CoV-2 spike protein, that increases with age [10]; another explanation may be due to the absence of maladaptive immune responses in children that lead to Acute Respiratory Distress Syndrome (ARDS) as in older age groups [11], however other unidentified mechanisms are still likely.

There are many challengeable questions in our case; the first one is that if the patient developed a subclinical asymptomatic COVID-19 infection that showed negative CT before the procedure then positive CT findings immediately after the procedure or if there is a role for ventilation system in transmission of COVID-19 infection. The available data showed that despite the possibility of COVID-19 spreading through the ventilation system ducts of Heating, Ventilation, and Air-Conditioning (HVAC) systems; there is still no evidence that human infection with SARS-CoV-2 could be caused by infectious aerosols through the HVAC and the risk is rated as very low [12]. The second option, we thought that she might have caught the infection, while she was doing her first HRCT chest as a lot of patients, are doing HRCT chest nowadays and it could be also a possible source of infection.

Another challengeable issue is that despite the usefulness of chest CT for screening for COVID-19 comparable to RT-PCR testing as reported [13]; Our patient showed negative CT chest for COVID pre-procedural that turned immediately to typical CT findings of COVID-19 after the procedure; this could be explained by delayed CT finding than RT-PCR but unfortunately, we could not be sure of that as the patient did not do RT-PCR before the procedure.

Finally, it is challenging to know the exact reason but we believe that this case presents a beneficial message for practice nowadays.

Conclusion

We present here a very unusual case of COVID-19 in an achalasia patient who underwent a POEM procedure and despite all precautions that were taken; there are still many debatable issues. Silent infection is an obstacle with having an important impact on the risk of infection transmission.

Declarations

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We confirm that this work is original and has not been published elsewhere, nor it is currently under consideration for publication elsewhere.

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The manuscript has been read and approved by all the authors and each author believes that the manuscript represents honest work.

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