

# Impact of COVID-19 on ERCP Practice: A Center Experience from North Africa

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## Abstract

**Background:** The COVID-19 pandemic has negatively influenced gastrointestinal endoscopy practice worldwide. We aimed to evaluate its impact on the ERCP practice. **Methods:** A cross-sectional study was conducted to analyze all ERCPs performed during 2020 in our unit by comparing the first trimester of the year or the pre-pandemic period with the rest of the year or the pandemic period. **Results:** We performed 149 ERCPs with 65 ERCPs (43.6%) during the pre-pandemic period and 84 ERCPs (56.4%) during the pandemic period. ERCPs volumes decreased by 57% during the pandemic period in comparison with the pre-pandemic period. The most ERCP indications were common bile duct stones and malignant biliary strictures with an increase in numbers of acute cholangitis during the pandemic period ( $p=0.035$ ). There was no difference regarding cannulation methods and technical success between the two periods. **Conclusion:** The COVID-19 pandemic has drastically affected the ERCP practice in our unit with a significant decrease in the ERCP volumes with an increase in the urgent ERCP indications.

**Keywords:** SARS-CoV-2, ERCP, Covid-19.

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## INTRODUCTION

On March 11th, 2020, the World Health Organization (WHO) declared a global pandemic due to Severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) infection which is responsible for multiple clinical manifestations (coronavirus disease 2019 or COVID-19) [1]. Morocco like other countries has been affected by the COVID-19 pandemic with 439,193 cases registered and 7.4 thousand deaths by the end of December 2020 [2]. Multiple international gastroenterology and endoscopy societies have published rigorous guidance on gastrointestinal endoscopic procedures during the COVID-19 pandemic and appropriate use of personal protective equipment (PPE) and stated to postpone non-urgent endoscopic procedures [3, 4, 5]. Based on two international surveys, endoscopic procedure numbers have been reduced by more than 75 % in many centers [6, 7]. Consequently, the gastroenterology and endoscopy units in Morocco and especially our center have been affected by the COVID-19 pandemic which was remodeled into the COVID-19 unit regarding the increased number of Intensive Care Units required for

patients infected with SARS-CoV-2 after the Moroccan Government proclaimed a nationwide lockdown by 20 March 2020. Among endoscopic procedures affected by the COVID-19 pandemic was the Endoscopic retrograde cholangiopancreatography (ERCP) which presents the most used procedure for the management of benign and malignant biliary diseases. Most guidance advised performing ERCP for hepatobiliary and pancreatic diseases associated with obstructive jaundice and complicated or not with biliary sepsis [3, 5]. We aimed to describe our experience regarding the impact of the COVID-19 pandemic on the ERCP practice by reporting the patient characteristics, ERCP indications, and procedure details.

## METHODS

### Study Design

A cross-sectional study was carried out over one year, from January to December 2020 within a Hepato-gastroenterology department, including all patients who underwent ERCP during the study period.

## Outcomes

The main outcomes of this study were the percentage reduction in the ERCP volumes performed, patient characteristics, ERCP indications, and technical characteristics during the pandemic period in comparison to the first trimester of the year 2020 or the pre-pandemic period. Other outcomes were barriers that affected the normal practice of ERCP during the pandemic.

## Data Collection and Ethical Considerations

The patient data were anonymously collected from a uniform structured reporting used in our department for ERCP procedures and the study protocol was conducted following the Helsinki Declaration and all patients have given their written informed consent in writing to publish their medical data.

## Statistical Analysis

Variables were reported as mean  $\pm$  standard deviation for parametric data and as frequencies (Percentage) for categorical variables. Comparative analysis was done using the appropriate tests (chi-square, Fisher's exact test, or Student's t-test). A p-value  $< 0.05$  was considered statistically significant. Statistical analyses were performed using SPSS v23 (IBM Corp, NY, USA).

## RESULTS

During 2020, 149 ERCPs were performed in our unit with 43.6% (n=65) during the first trimester of the year or "the pre-pandemic period" and 56.4%

(n=84) during the remaining three trimesters or "the pandemic period". Compared with the first trimester, we noticed an average 57% reduction in the ERCP volumes during the pandemic period, with a reduction of 63%, 43%, and 65% in the second, third, and fourth trimesters respectively (showed in Table 1). The use of PPE was respected following ESGE position statements and was as follows for all procedures: FFP2, shoe covers, gloves, Disposable hairnet, disposable face shield, and Water-proof disposable gowns. All procedures were conducted under Endotracheal intubation. There was no SARS-CoV-2 positive among the medical team whose included the senior endoscopist, follow, and nurse endoscopist. There were no significant differences between the pre-pandemic and the pandemic periods in terms of clinical characteristics, including age, sex, and the indication for ERCP. The most indication for ERCP was common bile duct (CBD) stones in more than 50% followed by malignant biliary strictures. We noted an increase in numbers of acute cholangitis in the pandemic period in comparison with the pre-pandemic period (p=0.035) (Table 2). The main cannulation methods used were the guidewire-assisted cannulation and the double guidewire with no difference between both periods. Technical success was achieved in 95.4% through the pre-pandemic period and 97.6% during the pandemic period with no significant difference between the two periods (p=0.65). Five patients required re-intervention at the first trimester versus one patient in the COVID-19 period with no statistically significant difference (Table 3).

**Table 1: Percentage reduction ERCP volumes during the pandemic period**

		ERCP numbers per month	ERCP numbers per trimester	Percentage reduction of ERCP volumes
Pre-Pandemic Period	<b>First trimester</b>			
	<b>January</b>	20	65	-
	<b>February</b>	23		
	<b>March</b>	22		
Pandemic Period	<b>Second trimester</b>			
	<b>April</b>	2	24	63%
	<b>May</b>	8		
	<b>June</b>	14		
	<b>Third trimester</b>			
	<b>July</b>	13	37	43%
	<b>August</b>	8		
	<b>September</b>	16		
	<b>Fourth trimester</b>			
	<b>October</b>	4	23	65%
	<b>November</b>	7		
	<b>December</b>	12		

**Table 2: Clinical characteristics of patients before and during the pandemic period**

	Pre-pandemic Period N= 65	Pandemic Period N = 84	p-value
<b>Age</b>	58.5 +/-17.7	60.4 +/-15.5	0.48
<b>Sexe</b>			0.76
Female	41 (63)	55 (66.5)	
Male	24 (37)	29 (35.4)	
<b>ERCP indications</b>			0.34
CBD stones	43 (66.2)	44 (52.4)	
Pancreatic Head Cancer	11 (16.9)	24 (28.6)	
Hilar Cholangiocarcinoma	7 (10.8)	12 (14.3)	
Gallbladder cancer involving CBD	3 (4.6)	2 (2.4)	
CBD injury	0	2 (2.4)	
Hepatic metastasis	1 (1.5)	0	
<b>Acute Cholangitis</b>	28 (43.1)	54 (64.3)	0.035
First trimester (N=65)	28	N/A	
Second trimester (N=24)	-	17 (70.8)	
Third trimester (N=37)	-	25 (67.6)	
Fourth trimester (N=23)	-	14 (52.2)	

**Table 3: Technical characteristics before and during the pandemic period**

Cannulation method	Pre-pandemic Period N= 65	Pandemic Period N = 84	p-value
Guidewire-assisted cannulation	46 (70.8)	53 (63.1)	
Double Guidewire	11 (16.9)	19 (22.6)	
Precut	3 (4.6)	10 (11.9)	
Other	1 (1.5)	0	
Failed	4 (6.2)	2 (2.4)	
<b>Technical success</b>	62 (95.4)	82 (97.6)	0.65
<b>Re-intervention</b>	5 (7.7)	1 (1.2)	0.086

## DISCUSSION

One year since the WHO declared the COVID-19 outbreak a pandemic, there were over 119 million confirmed cases of SARS-CoV-2 and more than 2.6 million deaths worldwide [2]. Several measures were implemented to reduce and protect against infection among patients and health workers had significantly affected patient care. The most relevant finding of the present study was the important reduction of ERCP volumes by 57% (compared with the first trimester) during the pandemic period as a consequence of COVID-19 related restrictions. This outcome might be due essentially to two reasons: reduction of the numbers of ERCP-day to one day per week rather than three days per week during the pandemic period and remodeling of our gastroenterology unit into a COVID-19 unit with an important reduction of inpatients. An international survey showed an 82% reduction in upper endoscopy procedures including esophagogastroduodenoscopy, endoscopic ultrasonography, and ERCP [8]. However, a Dutch study showed relatively no change in ERCP volumes that might be explained by the nature of the ERCP indications which mostly are emergencies [9]. Another finding of our study was the indication of ERCP with an increase of acute cholangitis during the pandemic period compared to the pre-pandemic period with a difference statistically significant ( $p=0.035$ ) which

might be explained by postponed or canceled elective ERCP and patients preferred to avoid the hospital where they might expose to COVID-19 (Table 2). Regarding cannulation techniques and Technical success, there was no difference statistically significant between the pre-pandemic and pandemic periods ( $p=0.65$ ) with a high rate of technical success ( $>97\%$ ) and low need for re-intervention during the pandemic period (Table 3). We didn't record any case of infection of the medical staff which might be explained by the systematic PCR-testing of patients undergoing ERCP and respect of the use of PPE.

## CONCLUSION

The COVID-19 pandemic has had a drastic influence on ERCP practice in our unit with a significant decrease in the ERCP volumes with an increase in the urgent ERCP indications. Nevertheless, technical success didn't seem affected by the pandemic.

### What is already known on this topic:

- COVID-19 had affected endoscopy activities worldwide
- ERCP seems to be not affected by COVID-19
- Delay in elective procedures

### What this study adds

- COVID-19 had affected either conventional endoscopy and interventional endoscopy

- Urgent ERCPs were most frequent
- Elective ERCPs were frequently postponed

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## REFERENCES

1. WHO Timeline - COVID-19 [Internet]. [cited 2020 May 20]. Available from: <https://www.who.int/news-room/detail/27-04-2020-who-timeline-covid-19>
2. Worldometer. COVID-19 coronavirus pandemic, <https://www.worldometers.info/coronavirus/> (accessed 11 March 2021).
3. Gralnek, I. M., Hassan, C., Beilenhoff, U., Antonelli, G., Ebigbo, A., Pellisè, M., ... & Dinis-Ribeiro, M. (2020). ESGE and ESGENA Position Statement on gastrointestinal endoscopy and the COVID-19 pandemic. *Endoscopy*, 52(06), 483-490.
4. Sultan, S., Lim, J. K., Altayar, O., Davitkov, P., Feuerstein, J. D., Siddique, S. M., ... & El-Serag, H. B. (2020). AGA rapid recommendations for gastrointestinal procedures during the COVID-19 pandemic. *Gastroenterology*, 159(2), 739-758.
5. Chiu, P. W. Y., Ng, S. C., Inoue, H., Reddy, D. N., Hu, E. L., Cho, J. Y., ... & Chan, F. K. (2020). Practice of endoscopy during COVID-19 pandemic: position statements of the Asian Pacific Society for Digestive Endoscopy (APSDE-COVID statements). *Gut*, 69(6), 991-996.
6. Repici, A., Pace, F., Gabbiadini, R., Colombo, M., Hassan, C., Dinelli, M., ... & Sharma, P. (2020). Endoscopy units and the coronavirus disease 2019 outbreak: a multicenter experience from Italy. *Gastroenterology*, 159(1), 363-366.
7. Forbes, N., Smith, Z. L., Spitzer, R. L., Keswani, R. N., Wani, S. B., Elmunzer, B. J., ... & Willingham, F. F. (2020). Changes in gastroenterology and endoscopy practices in response to the coronavirus disease 2019 pandemic: results from a North American survey. *Gastroenterology*, 159(2), 772-774.
8. Parasa, S., Reddy, N., Faigel, D. O., Repici, A., Emura, F., & Sharma, P. (2019). Global Impact of the COVID-19 Pandemic on Endoscopy: An International Survey of 252 Centers From 55 Countries. *J Chem Inf Model*, 53(9), 1689-1699.
9. Lantinga, M. A., Theunissen, F., Ter Borg, P. C., Bruno, M. J., Ouwendijk, R. J., & Siersema, P. D. (2021). Impact of the COVID-19 pandemic on gastrointestinal endoscopy in the Netherlands: analysis of a prospective endoscopy database. *Endoscopy*, 53(02), 166-170.