

The Influence of SARS-CoV-2 on Minimally Invasive Therapeutic Approach for Benign Prostatic Hyperplasia

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ABSTRACT

Introduction: The COVID-19 pandemic definitely changed the management of patients with benign prostatic hyperplasia (BPH). This study followed the modalities of treatments in patients with BPH associated with SARS-CoV-2 attending the Urology Clinic of "Sf. Ioan" Emergency Clinical Hospital, Bucharest, Romania.

Material and methods: The present study included 81 patients (mean age 63.2 years, age range 55–87 years) with SARS-CoV-2 and BPH who were admitted to our Urology Department between January 2021 and January 2022. The diagnosis of SARS-CoV-2 was based on the PCR test and that of BPH by using the diagnostic triad consisting of digital rectal examination, PSA, free PSA and ultrasound examination. It should be noted that some of the hospitalized patients were following treatment with alpha blockers and/or 5-alpha-reductase inhibitors at the time of admission.

Results: Out of the 81 hospitalized cases, 13 required emergency endoscopic intervention under spinal anaesthesia (TURP or TURiP) for haemostasis because those patients presented with persistent haematuria which did not respond to conservative treatment. A number of 17 cases showed acute urinary retention during hospitalization and a urethrovessical catheter was fitted and will be re-evaluated urologically after the COVID episode. Of the remaining 51 subjects with BPH, 17 already had chronic urinary retention on admission, with urethrovessical probe present, 13 cases began during hospitalization with alpha-blocker treatment associated with 5-alpha-reductase inhibitors; meanwhile, there were no urological interventions to modify the treatment regimen in the remaining 21 patients, who were strictly managed on the side of COVID-19 infection.

Conclusions: There was no clear influence of the evolution of patients with BPH due to SARS-CoV-2 pathology, and the general management trend was to delay chronic cases until the time of viral infection remission.

Keywords: BPH, COVID-19, management, treatment.

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INTRODUCTION

SARS-CoV-2 pandemic was a turning point in our life, which brought with it a multitude of new realities and difficulties requiring answers that sometimes needed to be adopted in a less than optimal time period. In this context, the management of patients with benign prostatic hyperplasia (BPH), who represent an extremely high share among men aged 50 and older, had to adapt to the new conditions, which led to a series of changes in the dynamics of the evolution of cases. In this context, BPH is affecting a substantial number of men aged 50 and older. As a result, a decrease in the proportion of patients suffering from BPH who also had persistent partial urine retention was reported as an operational indication for transurethral resection of the prostate (TURP) (1). At the same time, in urgent cases such as acute urinary retention/total haematuria, a preference was observed from both the patients and medical staff for minimal interventions and for the timing of surgical treatment, with reduced operative time and average length of hospitalization in non-COVID patients (2). This resulted in shorter lengths of hospitalization for patients who did not have COVID.

However, there is no general agreement on this subject, with studies such as that conducted by Topaktas *et al* observing no increase in mortality among patients with BPH during the pandemic, while maintaining a reasonable influx on patients (3). This suggests that there is not a single definitive answer to this question. On the other hand, the findings of a different study by Haghpanah *et al* (4) imply a potential contribution of SARS-CoV-2 to worsening the symptoms of patients with BPH as well as their overall health.

Cases with COVID-19 had many comorbidities, which required a multidisciplinary approach and ultimately resulted in a significant prolongation of hospitalization. As a result, there was a significant reduction in the use of open adenectomy, both from the standpoint of the European Association of Urology (EAU) guidelines and the requirement to reduce the risk of COVID-19 infection. Additionally, there has been a reduction in the proportion of mono- and bipolar TURP interventions due to patients' preference for drug treatment but also as a result

of implementing measures to prevent the spread of SARS-CoV-2 (5). In point of fact, a number of investigations came to the conclusion that the majority of urologists polled delayed their interventions during the pandemic (6).

The endourological treatment of prostate adenoma required gradual modifications to the working methods, including the deployment of protection measures and particular circuits, in order to limit viral propagation. However, in a study on pandemic patients in Brazil, Alva Pinto *et al* found that endoscopic treatments would have a lower probability of SARS-CoV-2 contamination than laparoscopic or open surgery – hence, patients are safer; however, no reliable data are currently available (7). □

MATERIAL AND METHODS

The present study included patients with SARS-CoV-2 and BPH who were admitted to our Urology Department between January 2021 and January 2022. Patients' ages ranged between 55–87 years, with the mean age being 63.2% of their actual age. The PCR test was used to diagnose SARS-CoV-2, while the diagnostic triad of digital rectal examination, including PSA, free PSA and ultrasound examination, was used to diagnose BPH. Both diagnoses were based on the results of the tests. Importantly, at the time of admission, some of the patients requiring hospitalization were already receiving treatment with alpha-blockers and/or 5-alpha-reductase inhibitors. All patients underwent the admission procedure on an individual basis, which included a thoracic CT scan, an electrocardiogram, general ultrasonography, urine tests (including urine culture and urine summary), and blood tests (complete blood count, blood sugar, urea, creatinine, coagulation test, ferritin, D-dimers, TGO, TGP, total and direct bilirubin, CRP). In certain instances, a CT scan of the abdomen and pelvis was conducted in addition to the initial imaging examination. During the procedures, a monopolar Karl Storz resection equipment was utilized for the TURP and a bipolar Olympus device for the TURiSP. In both techniques, haemostasia was performed using the roller-balls. All patients were anti-coagulated according to a scheme prescribed by a cardiologist and epidemiologist. The statistical analysis was performed using SPSS 2.0 pro-programme. □

RESULTS

Among all study participants, associated comorbidities were present in 79 patients with SARS-CoV-2 infection, including cardiac pathology (AHT, chronic cardiac disease, angina) in 51 subjects, metabolic disease (obesity, diabetes mellitus) in 10 subjects, kidney disease (CKD) in seven subjects, infectious disease (VHB, VHC) in three subjects, history of colonic or rectal neoplasia in five subjects and chronic obstructive pulmonary disease (COPD) in three subjects. The severity of SARS-CoV-2 was especially evaluated through thoracic CT scan, which showed lung damage to an extent of 0-30% in 48 cases, 30-70% in 26 patients and 70-90% in seven cases. Beside the respiratory complications, there was no other type of complications linked to SARS-CoV-2 pathology in this group.

Out of the 81 hospitalized cases, 13 required an urgent endoscopic procedure under spinal anaesthesia (TURP or TURiSP) for haemostasis (Figure 1). These patients had chronic haematuria that had not improved with conservative care. An urethrovessical catheter was fitted for the 17 patients with acute urine retention during hospitalization, who had a new urological evaluation following the COVID episode. Of the remaining 51 cases with BPH, 13 subjects started an alpha-blocker treatment along with 5-alpha-reductase inhibitors during their hospital stay, whereas the remaining 21 cases did not need any urological interventions to modify the treatment regimen and were therefore managed solely on the side of COVID-19 infection. Of the remaining 51 cases, 17 subjects had chronic urinary retention requiring the presence of an urethrovessical probe at the time of admission. Excepting 17 patients who needed ventilatory support, of whom five died, subjects generally presented a favourable evolution, with low oxygen demands (< 5 L/h) in 61 cases and at term discharge. Eight patients who needed emergent endoscopic intervention required ventilatory support and had a longer hospital stay than the others (an average of 20.5 days *versus* 15.6 days). Additionally, the operating group experienced more problems than the non-operating group (90.6% *versus* 61.3% Clavien I, 53.9% *versus* 31.9% Clavien 2, 28.1% *versus* 10.9% Clavien 3, and 17.8% *versus* 4.7% Clavien 4, 2.4% *versus* 3.6% Clavien 5) (Table 1). For all of them, there



FIGURE 1. BPH in COVID-19 patients. Bipolar haemostasis after resection

TABLE 1. The complication rates in operated *versus* non-operated cases

Clavien Dindo Score	Operated cases	Non-operated cases	p values
Clavien I	90.6%	61.3%	<0.05
Clavien II	53.9%	31.9%	<0.05
Clavien III	28.1%	10.9%	<0.05
Clavien IV	17.8%	4.7%	<0.05
Clavien V	2.4%	3.6%	<0.05

was a statistically significant difference between the percentage of operated *versus* non-operated cases, in favour of the operated cases. Even if Clavien-Dindo score is used for operated patients, for a better understanding of the complications (which are not different between the groups) we chose to present them together with the non-operated cases. □

DISCUSSION

The outbreak of the ongoing global Coronavirus disease 2019 (COVID-19) pandemic was caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) – first identified in late 2019, in Wuhan, China – and produced a great global catastrophe (8). During the pandemic, the management of our patients with BPH associated with COVID-19 aimed to overcome problems caused by the viral infection and to limit the influence of BPH management on the viral pathology. In order to accomplish this goal while the virus was still present, the surgical approach was scaled back to its barest essentials. During the COVID-19 pandemic, the diagnosis and prescription of BPH treatment had to be based on telemedicine and joint protocols for primary care attention and urology, as shown by the review of Medina-Polo *et al* (9), who came to the conclusion that the surgical technique associated with the fewest complications and shortest hospitalization should be chosen. In accor-

dance with their findings, we took similar decisions regarding our cases. There is a correlation between age and BPH progression, which leads to a significant increase in the number of older men being diagnosed with BPE (10). As a result, it is reasonable to assume that a sizeable proportion of older male patients diagnosed with COVID-19, including those with severe instances, may also have BPH as a concomitant condition, and that COVID-19 may exacerbate BPH in these patients. Recent emerging studies have suggested that LUTS may represent increased early symptoms of COVID-19 and that IPSS, particularly in older male subjects, may be possible complications of this disease (11, 12). These hypotheses are based on the idea that LUTS may be among the contributors to the increased incidence of COVID-19. In our study, this hypothesis has not been verified because the largest part of patients maintained their symptoms during hospitalization and afterwards without major changes, excepting the SARS-CoV-2 treatment. In the very few operated cases, there was no certitude that their situation would have been different without COVID-19.

On the other hand, it has been suggested that prostatic inflammation was a risk factor for the progression of BPH (13). Another suggestion was that infection with SARS-CoV-2 and subsequent suppression of ACE2 may lead to activation of

pro-inflammatory pathways, increased cytokine release, and consequently, may cause inflammatory responses in vulnerable organs such as the prostate (14). This may partly explain why there is a higher morbidity rate in operated patients, since the inflammatory syndrome is more prevalent in those cases than in non-operated ones and the percentage of complications in our study is also higher among operated versus non-operated cases. However, there are no studies looking into the possibility of BPH progression as a complication of SARS-CoV-2 infection. However, the common inflammation pathway might lead to an aggravation of BPH-related LUTS and its complications both during the course of infection with SARS-CoV-2 and after the infection has run its course (4). □

CONCLUSIONS

The SARS-CoV-2 pandemic generated new challenges for all medical fields, including urological pathologies such as benign prostatic hyperplasia, for which the general management trend was to delay chronic cases until the time of viral infection remission, in order to reduce morbidity as much as possible. □

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