SARS-COV2 in patients with benign prostatic hyperplasia – outcomes for minimally invasive therapeutic approach

Bălăcescu S[1], Georgescu D[1,2], Multescu R[1,2], Ene C[1,2], Mares C[1], Bulai C[1,2], Militaru A[1], Pungă A[1], Alexandrescu E[1], Geavlete P[1,2], Geavlete B[1,2]

[1] "St. John" Clinical Hospital of Emergency – Department of Urology
[2] „Carol Davila" University of Medicine and Pharmacy

ABSTRACT

Introduction: The COVID-19 pandemic fundamentally altered the therapeutic approach to patients diagnosed with benign prostatic hyperplasia (BPH). The present study evaluated and documented the treatment strategies applied to patients presenting with BPH concomitant with SARS-CoV-2 infection within the Urology Clinic of St. John's Emergency Clinical Hospital.

Material and Methods: This study included patients diagnosed with concurrent SARS-CoV-2 infection and benign prostatic hyperplasia (BPH) who were hospitalized in the Urology Department between January 2021 and January 2024. The age of the study population ranged from 53 to 89 years, with a mean age of 61.2 years. The diagnosis of SARS-COV2 was made based on the PCR test, and that of BPH, using the diagnostic triad: digital rectal examination, PSA, freePSA and ultrasound examination.

Results: Of the 94 hospitalized patients, 25 required urgent endoscopic intervention under spinal anesthesia, consisting of either transurethral resection of the prostate (TURP) or transurethral resection in saline (TURisP), performed for hemostatic purposes due to persistent chronic hematuria refractory to conservative management. Additionally, 26 patients developed acute urinary retention during hospitalization and underwent urethrovesical catheterization, with plans for subsequent urological reassessment following recovery from COVID-19. Moreover, 16 patients requiring emergency endoscopic intervention necessitated ventilatory support and demonstrated significantly prolonged hospitalization compared to those who did not undergo surgical procedures (mean duration: 21.3 days versus 14.9 days). Also, the surgically treated group exhibited a higher incidence of postoperative complications when compared to the non-operated cohort.

Conclusions: No definitive impact of SARS-CoV-2 infection on the clinical progression of benign prostatic hyperplasia (BPH) was observed. Consequently, the prevailing management strategy consisted of deferring the treatment of chronic BPH cases until the resolution of the viral infection.

Key words: BPH, COVID-19, management, treatment

Correspondence to: Dr. Ștefan Bălăcescu M.D.
"Sf. Ioan" Clinical Hospital of Emergency, 13, Vitan Barzesti, Bucharest, Romania
Department of Urology - „Carol Davila" University of Medicine and Pharmacy, Bd. Eroii Sanitari 8, Bucharest, Romania
Tel / Fax: +40748699383
e-mail:balacescu11@gmail.com

Introduction

The SARS-CoV-2 pandemic constituted a pivotal moment in contemporary healthcare, introducing unprecedented challenges and necessitating rapid implementation of responses that were frequently adopted under suboptimal temporal and logistical conditions. Within this framework, the management of patients diagnosed with benign prostatic hyperplasia (BPH)—a condition with notably high prevalence among men aged 50 years and older—required substantial adaptation to the evolving healthcare environment. These adjustments subsequently led to measurable alterations in the clinical course and management dynamics of BPH cases.

During this period, a reduction was observed in the proportion of BPH patients presenting with persistent partial urinary retention as an operational indication for transurethral resection of the prostate (TURP) [1]. Concurrently, in emergency presentations such as acute urinary retention or total hematuria, both patients and healthcare providers demonstrated a discernible preference for minimally invasive approaches and deferment of surgical intervention. This strategic shift resulted in decreased operative durations and shorter average hospitalization periods among non-COVID-19 patients [2], thereby contributing to an overall reduction in inpatient length of stay.

Nevertheless, the literature does not reflect a universal consensus regarding these observations. For instance, Topaktas et al. reported no statistically significant increase in mortality among BPH patients during the pandemic while maintaining a stable patient inflow [3], indicating variability in institutional experiences and outcomes. These findings underscore the absence of a definitive, uniform conclusion. Conversely, research conducted by Haghpanah et al. [4] suggests a potential contributory role of SARS-CoV-2 infection in exacerbating lower urinary tract symptoms in BPH patients, as well as negatively impacting their general health status.

Patients infected with COVID-19 frequently presented with multiple concomitant comorbidities, thereby necessitating a multidisciplinary therapeutic approach and resulting in a substantial prolongation of hospitalization duration. Collectively, these factors contributed to a pronounced decline in the utilization of open adenomectomy procedures, both in alignment with European Association of Urology (EAU) guidelines and as a precautionary measure to minimize the risk of viral transmission. Furthermore, there was a notable decrease in the frequency of mono- and bipolar TURP procedures, attributed to increased patient preference for pharmacological management and the enforcement of strict infection control protocols aimed at limiting SARS-CoV-2 spread [5]. Indeed, multiple studies have indicated that the majority of surveyed urologists opted to postpone surgical interventions throughout the course of the pandemic [6].

Material and Methods

This study included patients diagnosed with concurrent SARS-CoV-2 infection and benign prostatic hyperplasia (BPH) who were hospitalized in the Urology Department between January 2021 and January 2024. The age of the study population ranged from 53 to 89 years, with a mean age of 61.2 years.

The diagnosis of SARS-CoV-2 infection was confirmed through polymerase chain reaction (PCR) testing, while BPH was established based on a comprehensive diagnostic approach that incorporated digital rectal examination (DRE), serum prostate-specific antigen (PSA) and free PSA determinations, as well as ultrasonographic evaluation. Both conditions were diagnosed in accordance with the results of these standardized investigations. It is noteworthy that a subset of patients was already undergoing pharmacological management with alpha-adrenergic blockers and/or 5-alpha-reductase inhibitors at the time of admission, a factor that was duly considered in the interpretation of clinical findings.

Upon hospital admission, all patients underwent an extensive and standardized evaluation protocol, which included thoracic computed tomography

(CT), electrocardiography, general ultrasonography, urinalysis (comprising urine summary and urine culture), and comprehensive blood analyses. Laboratory investigations encompassed hematological profile (HLG), glycemia, urea, creatinine, coagulation parameters, ferritin levels, D-dimer values, hepatic transaminases (AST/TGO and ALT/TGP), total and direct bilirubin, and C-reactive protein (CRP). In selected cases, additional imaging in the form of abdominopelvic CT scans was performed to supplement the initial radiological assessment.

Results

Among the studied population, 94 patients presented with additional comorbidities alongside SARS-CoV-2 infection. Of these, 57 cases were associated with cardiovascular pathology, including arterial hypertension (AHT), chronic cardiac disease, and angina pectoris. Metabolic disorders, such as obesity and diabetes mellitus, were identified in 15 cases, while chronic kidney disease (CKD) was present in 6 patients. Infectious comorbidities, namely hepatitis B virus (HBV) and hepatitis C virus (HCV) infections, were observed in 8 cases. Furthermore, 9 patients had a documented history of malignancy, specifically colorectal neoplasia, and 7 cases were diagnosed with chronic respiratory diseases, predominantly chronic obstructive pulmonary disease (COPD).

The severity of SARS-CoV-2 infection was primarily assessed using thoracic computed tomography (CT), with the degree of pulmonary involvement serving as the main indicator. Pulmonary damage ranged from 0–30% in 57 patients, 30–70% in 29 patients, and 70–90% in 8 patients. Apart from respiratory manifestations, no additional systemic complications attributable to SARS-CoV-2 were recorded in this cohort.

Of the 94 hospitalized patients, 25 required urgent endoscopic intervention under spinal anesthesia, consisting of either transurethral resection of the prostate (TURP) or transurethral resection in saline (TURisP), performed for hemostatic purposes due to persistent chronic hematuria refractory to conservative management [Fig. 1, 2]. Additionally, 26 patients developed acute urinary retention during hospitalization and underwent urethrovesical catheterization, with plans for subsequent urological reassessment following recovery from COVID-19.

Among the remaining 68 patients diagnosed with BPH, 38 initiated pharmacological therapy during hospitalization, receiving alpha-adrenergic blockers in combination with 5-alpha-reductase inhibitors. In contrast, the remaining 30 patients did not undergo any modification of their urological treatment, with clinical management focused exclusively on the SARS-CoV-2 infection.

Notably, 16 patients requiring emergency endoscopic intervention necessitated ventilatory support and demonstrated significantly prolonged hospitalization compared to those who did not undergo surgical procedures (mean duration: 21.3 days versus 14.9 days). Moreover, the surgically treated group exhibited a higher incidence of postoperative complications when compared to the non-operated cohort, as classified by the Clavien–Dindo system: Grade I (91.4% vs 60.8%), Grade II (51.9% vs 30.7%), Grade III (27.4% vs 11.6%), Grade IV (15.2% vs 4.3%), and Grade V (2.2% vs 4.1%) [Table 1]. These differences were statistically significant, with a higher complication rate observed in the operated group.

Clavien Dindo Score	Operated Cases	Non-operated Cases	p values
Clavien I	91.4%	60.8%	<0.05
Clavien II	51.9%	30.7%	<0.05
Clavien III	27.4%	11.6%	<0.05
Clavien IV	15.2%	4.3%	<0.05
Clavien V	2.2%	4.1%	<0.05

Table 1. The complication rates in the operated versus non-operated cases

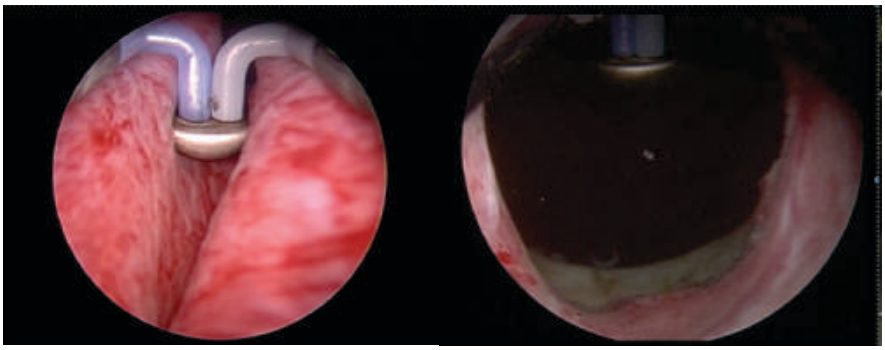


Fig. 1 Transurethral view of the prostate before and after TURisP.



Fig.2. Intraoperative aspects of a TURisP during COVID-19 pandemic period.

Discussion

During the COVID-19 pandemic, the diagnostic and therapeutic management of benign prostatic hyperplasia (BPH) has been recommended to rely primarily on telemedicine-based evaluation and standardized collaborative protocols integrating primary care and urology services, as highlighted in the review conducted by Medina-Polo et al. [7]. The authors concluded that, under pandemic constraints, the surgical approach associated with the lowest complication rate and shortest hospitalization should be preferentially selected — a principle that was likewise adopted in the present study.

A well-established correlation exists between advancing age and the progression of BPH, resulting in a substantial increase in the prevalence of benign prostatic enlargement (BPE) among elderly male populations [8]. Consequently, it is reasonable to infer that a significant proportion of older male patients diagnosed with COVID-19, including those presenting with severe forms of the disease, may concurrently suffer from BPH, and that SARS-CoV-2 infection could potentially exacerbate the clinical severity of this condition. Emerging evidence has suggested that lower urinary tract symptoms (LUTS) may represent early manifestations of COVID-19 and that elevated International Prostate Symptom Score (IPSS), particularly in elderly men, could reflect a possible complication associated with the disease [9,10]. These hypotheses are grounded in the proposed association between LUTS and an increased incidence of SARS-CoV-2 infection.

However, this assumption was not substantiated in our cohort, as the majority of patients demonstrated relative stability of urinary symptoms both during and following hospitalization, with no significant variation attributable beyond the effects of SARS-CoV-2-specific treatment. Furthermore, in the limited number of surgically managed cases, it remains uncertain whether the clinical trajectory would have differed in the absence of COVID-19 infection. Conversely, prostatic inflammation has been identified as a recognized risk factor for the progression of BPH [11]. Additionally, it has been proposed that SARS-CoV-2 infection, through downregulation of angiotensin-converting enzyme 2 (ACE2), may activate pro-inflammatory signaling cascades, promote excessive cytokine release, and induce inflammatory responses in susceptible organs, including the prostate gland [12]. This pathophysiological mechanism may partially elucidate the increased morbidity observed among surgically treated patients in our study, as inflammatory syndrome was more pronounced in these individuals and correlated with a higher rate of post-intervention complications compared to non-operated cases.

Despite these observations, there is currently a paucity of empirical evidence directly linking SARS-CoV-2 infection to accelerated progression of BPH. Nevertheless, the shared inflammatory pathways implicated in both conditions may contribute to the exacerbation of BPH-associated LUTS and their sequelae during the acute phase of COVID-19 as well as in the post-infectious period [4].

Conclusions

The SARS-CoV-2 pandemic introduced unprecedented challenges across all medical specialties. In this context, the prevailing clinical strategy involved postponing elective and chronic cases until the resolution of active viral infection, with the primary objective of minimizing patient morbidity and reducing the risk of perioperative and postoperative complications.

References

1. Roehrborn CG. Male lower urinary tract symptoms (LUTS) and benign prostatic hyperplasia (BPH) Med Clin. 2011;95:87–100.
2. Stensland KD, Morgan TM, Moinzadeh A, Lee CT, Briganti A, Catto JWF, et al. Considerations in the Triage of Urologic Surgeries During the COVID-19 Pandemic. Eur Urol. 2020; 77:663-6.
3. Topaktaş R, Tokuç E Kutluhan MA, Akyüz M, Karabay E, Çalışkan S. Clinical features and outcomes of COVID-19 patients with benign prostatic hyperplasia in aging male: A retrospective study of 18 cases. Int J Clin Pract. 2020 Jun 7 : e13574.

4. Haghpanah A, Masjedi F, Salehipour M, Hosseinpour A, Roozbeh J, Dehghani A. Is COVID-19 a risk factor for progression of benign prostatic hyperplasia and exacerbation of its related symptoms?: a systematic review. Prostate Cancer Prostatic Dis. 2021 May 18 : 1–12.
5. Ribal MJ, Cornford P, Briganti A, Knoll T, Gravas S, Babjuk M, Harding C, Breda A, Bex A, GORRG Group. Rassweiler JJ, Gözen AS, Pini G, Liatsikos E, Giannarini G, Mottrie A, Subramaniam R, Sofikitis N, Rocco BMC, Xie LP, Witjes JA, Mottet N, Ljungberg B, Rouprêt M, Laguna MP, Salonia A, Bonkat G, Blok BFM, Türk C, Radmayr C, Kitrey ND, Engeler DS, Lumen N, Hakenberg OW, Watkin N, Hamid R, Olsburgh J, Darraugh J, Shepherd R, Smith EJ, Chapple CR, Stenzl A, van Poppel H, Wirth M, Sønksen J, N'Dow J, EAU Section Offices and the EAU Guidelines Panels EAU Guidelines Office Rapid Reaction Group: an organisation-wide collaborative effort to adapt the EAU guidelines recommendations to the COVID-19 era. Eur Urol. 2020;78(1):21–28.
6. Naspro RPL. Urology in the time of corona. Nat Rev Urol. 2020: 24-29.
7. Medina-Polo J, Téigell Tobar J, Romero-Otero J, Carballido-Rodríguez J, Domínguez-Esteban M, Martínez-Berganza ML, Miñana-López B, Unda Urzaiz JM, Rodríguez-Antolín A. Benign prostatic hyperplasia management during COVID-19 pandemia. Arch Esp Urol. 2020 Jun;73(5):405-412.
8. Berry SJ, Coffey DS, Walsh PC, Ewing LL. The development of human benign prostatic hyperplasia with age. J Urol. 1984;132:474–9.
9. Can O, Erkoç M, Ozer M, Umeyir Karakanli M, Otunctemur A. The effect of COVID-19 on lower urinary tract symptoms in elderly men. Int J Clin Pract. 2021;75:e14110.
10. Kaya Y, Kaya C, Kartal T, Tahta T, Tokgöz VY. Could LUTS be early symptoms of COVID-19. Int J Clin Pract. 2020;75:e13850.
11. Madersbacher S, Sampson N, Culig Z. Pathophysiology of benign prostatic hyperplasia and benign prostatic enlargement: a minireview. Gerontology. 2019;65:458–64.
12. Chai X, Hu L, Zhang Y, Han W, Lu Z, Ke A, et al. Specific ACE2 expression in cholangiocytes may cause liver damage after 2019-nCoV infection. bioRxiv. 2020.