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Underactive and low compliance bladder: A possible Presentation of COVID-19 vaccination

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ABSTRACT

Vaccine-related adverse events have been increasingly reported as the COVID-19 vaccination campaign progresses worldwide. Urological symptoms after COVID-19 vaccination are reported rarely. Herein, we report a case of urinary retention following the second dose of Oxford/AstraZeneca COVID-19 vaccine injection.

Case report

A 74-year-old woman with a history of controlled diabetes mellitus (HbA1C=5), a history of hysterectomy 25 years ago, and no previous history of urinary complications, referred to our center with a complaint of voiding dysfunction and urinary retention after receiving the second dose of Oxford/AstraZeneca vaccine.

The first dose of vaccine was injected in June 2021, followed by a second dose in November 2021. She stated that after the first dose of vaccine, she had voiding dysfunction, suprapubic pain, hesitancy, weak urine stream, and straining. The pharmacotherapy delivered due to clinical suspicion of cystitis, and over time, the condition was improved. One week after the second dose of Oxford/AstraZeneca vaccine, patient returned with urinary frequency and high blood pressure.

She was admitted to the emergency department and due to high blood pressure (BP:180/100 mmhg) and rise in creatinine level (2 mg/dl). Upon initial examination, suprapubic fullness and tenderness were detected. She underwent an ultrasound (US) that indicated an increased post-void residual (>400 ml), and bilateral hydroureteronephrosis. Both RT-PCR and CT scan rule out any Covid-19 infection.

After urinary catheterization, the blood pressure became normal (BP<140/90), and the creatinine level was decreased (1.6 mg/dl). After several catheterizations, she was still unable to urinate, and therefore, we performed a urodynamic study. Urodynamic results showed low compliance and underactive detrusor (Fig. 1). In the filling phase of urodynamic, decreased sensation with normal capacity, low compliance bladder were observed. In the voiding phase, the patient had underactive detrusor function and low uroflowmetry flow, with a high PVR of more than 200cc. The patient underwent clean intermittent catheterization and follow-up for any improvement.

Discussion

Discussion Till December 2021, ESNEFT AstraZeneca and Pfizer Covid-19 vaccine reported a total of 2687 different renal and urinary disorders, that among them 100 urinary retention cases was observed (Report Run Date: 20-Dec-2021). The other common reported symptoms were urinary incontinence (n=129), micturition urgency (n=102), and dysuria (n=88). However, to our knowledge, we did not find the detail of urodynamic study in none of the cases. Based on the urodynamics, showed low compliance and underactive detrusor was detected.

The FDA Vaccine Adverse Event Reporting System (VAERS) quantifies and describes all symptoms following COVID-19 vaccinations, in its July 2021 version, reported only 0.7% described urologic symptoms among 15,785 adverse events, Urinary symptoms that were reported, were related to the Pfizer-BioNTech vaccine (61%), and Moderna vaccine (39%). In this report, more than half of the patients were female (54%), and the median (IQR) age was 63 years (IQR 44–79, Range: 19–96) [1].

Although the previous report indicated that urinary symptoms such as increased urinary frequency should be considered as an important overlapping symptom with urosepsis in the differential diagnosis of COVID-19 [2], a multicenter study did not report any lower urinary

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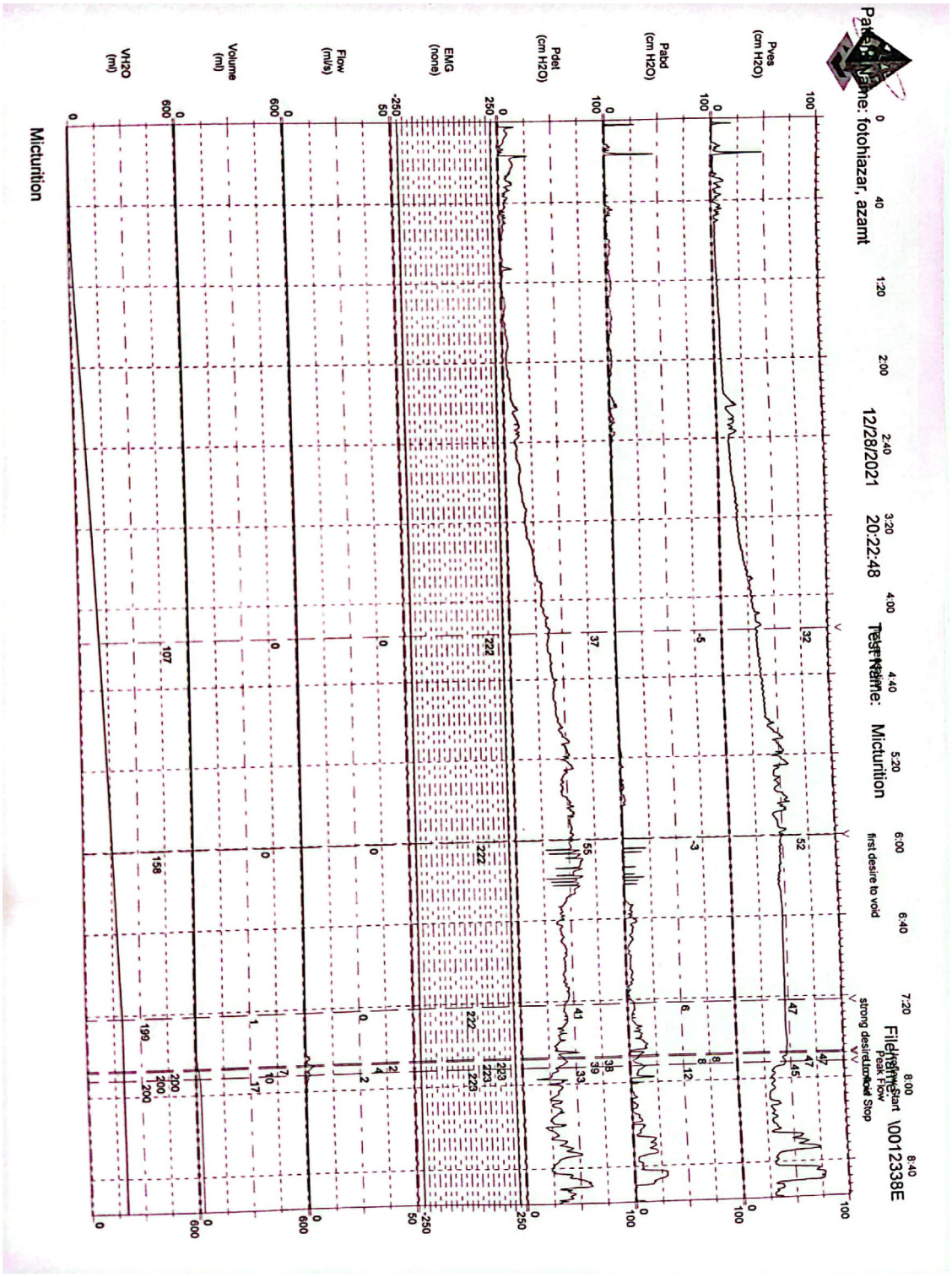

Fig. 1. The urodynamic study's result of the represented case.

tract symptoms in patients who had a positive urine SARS-CoV-2 PCR. However, hematuria, WBC, and SARS-CoV-2 presence in the urine, were strong negative prognostic factors in COVID-19 patients [3].

Saleh et al. [4] reported a patient with COVID-19 who presented unusually with urinary retention and syndrome of inappropriate antidiuretic hormone secretion (SIADH). Their findings revealed that

urine retention could be an unusual presenting symptom of severe hyponatremia of COVID-19.

Since the FDA VAERS is a passive reporting system designed to help monitor the safety of vaccines, submissions reports and event descriptions are limited. Therefore, creating a direct connection to establish a causal link between vaccination and the symptom is impossible. For example, this system reported 22 cases of hematuria without any details of the patient's past medical history. Two third of urological symptoms adverse events were reported after the first dose of vaccine, and thus, it can be argued that some of these complaints, such as lower urinary tract symptoms, maybe due to the immune response elicited by the vaccine. Another limitation may be the bias in reporting adverse events. This is because some patients report severe symptoms after the first dose, while patients with milder symptoms may not report any side effects with any dose of the vaccine. Because VAERS is voluntarily registered by patients, it may not represent all urological side effects [1].

Our case represents an underactive bladder (UAB). According to the definitions, UAB is characterized by "prolonged voiding, hesitancy, and slow and/or intermittent stream with or without a sensation of incomplete bladder emptying" [5]. It remains a condition with insufficient and ineffective treatment options. Its symptoms overlap with lower urinary tract symptoms of overactive bladder patients and bladder outlet obstruction (BOO), often leading to UAB patients' misdiagnosis [6]. UAB negatively affect the patients quality of life, besides the sequel of urinary retention, and therefore needs more attention. We neither attempt to establish nor rule out a causal link between the COVID-19 vaccine and underactive bladder through this case report, and such a link requires extensive case-control studies. However, we must highlight any events that may occur following the vaccine [7,8]. This may also be related to rapidly developing vaccines, testing programs, drug licensing, and vaccine production, which may create room for error that requires careful microscopic examination by the scientific community.

Patient consent

The patient has provided her signed consent to publication and submit, as a supplemental file.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

References

[1] H. Zhao, C. Souders, M. Carmel, J.T. Anger, Low rates of urologic side effects following coronavirus disease vaccination: An analysis of the food and drug administration vaccine adverse event reporting system, Urology 153 (2021) 11–13.
[2] J.-N. Mumm, A. Osterman, M. Ruzicka, C. Stihl, T. Vilsmaier, D. Munker, et al., Urinary frequency as a possibly overlooked symptom in COVID-19 patients: Does SARS-CoV-2 cause viral cystitis? Eur Urol. 78 (4) (2020) 624–628.
[3] A.J.B. Mar, C. Bach, D. Janssen, J. Heesakkers, M. Ghojazadeh, T.A. Vögeli, et al., Lower urinary tract signs and symptoms in patients with COVID-19, BMC Infect. Dis. 21 (1) (2021) 706.
[4] A.O. Saleh, S.D. Al-Shokri, A.O. Ahmed, A.E. Musa, M.F. Mohamed, Urinary retention and severe hyponatremia: An unusual presentation of COVID-19, Eur. J. Case Rep. Intern. Med. 7 (10) (2020) 001905.
[5] C.R. Chapple, N.I. Osman, L. Birder, R. Dmochowski, M.J. Drake, Terminology report from the International Continence Society (ICS) Working Group on Underactive Bladder (UAB), 37, (8) 2018, pp. 2928–2931.
[6] J. Gani, D. Hennessey, The underactive bladder: diagnosis and surgical treatment options, Transl. Androl. Urol. 6 (Suppl. 2) (2017) S186–s95.
[7] J. Gee, P. Marquez, J. Su, G.M. Calvert, R. Liu, T. Myers, et al., First month of COVID-19 vaccine safety monitoring - United States, December 14, 2020-January 13, 2021, MMWR Morb. Mortal Wkly Rep. 70 (8) (2021) 283–288.
[8] F.P. Polack, S.J. Thomas, N. Kitchin, J. Absalon, A. Gurtman, S. Lockhart, et al., Safety and efficacy of the BNT162b2 mRNA Covid-19 vaccine, New England J. Med. 383 (27) (2020) 2603–2615.