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## The effect of COVID-19 outbreak on endourological treatments for urinary stones: A retrospective multicentric study

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**Introduction & Objectives:** The COVID-19 outbreak has brought challenges to the global healthcare community. The management of upper urinary tract stones has been affected even further, with potential severe sequelae for patient's health.

**Materials & Methods:** We report a multicentric retrospective study involving 9 Centers regularly delivering treatment for upper tract urinary stones across the country. All Centers suffered significant limitations during the pandemic period due to government limitations. We compared the 12 months-period prior to COVID-19 (from march 1<sup>st</sup> 2019 to February 28<sup>th</sup> 2020, named as period A) with post-COVID-19 period (from march 1<sup>st</sup>, 2020 to February 28<sup>th</sup>, 2021 named as period B). Aim of the study was to compare endourological procedures for upper urinary stones during period A and the period B. This study investigated all types of surgeries for stones delivered in both elective and emergency setting.

**Results:** A total of 4018 procedures were collected, including 2176 procedures in period A. In period B, 1842 procedures were carried out, corresponding to a loss of 15.35% of cases ( $p < 0.001$ ). Looking into elective cases, 1622 procedures were delivered in period A, compared to 1280 in period B, resulting in a loss of 342 cases corresponding to 21.81% ( $p = 0.001$ ). All types of stone treatments resulted affected, including ESWL (from 487 cases in period A to 344 in period B, -29.37%,  $p = 0.001$ ), PCNLs (from 170 to 125 cases, corresponding to -26.47%,  $p = 0.008$ ), retrograde surgery for renal stones (from 433 to 387 cases, -10.63%,  $p = 0.008$ ) and for ureteric stones (from 614 cases to 484, -21.18%,  $p = 0.008$ ). Additionally, waiting lists resulted affected, with significant delays in period B. In particular, for ureteric stones, mean waiting time in period A was 61.5 days compared to 87.5 days in period B ( $p = 0.008$ ). Regarding renal stones, waiting list increased from 64.74 days in period A to 85.66 days in period B for RIRS. The waiting list for percutaneous surgeries increased from 79 days to 103 days ( $p = 0.001$ ). We did not find any patient which acquired COVID-19 during hospitalization for elective or urgent surgery. We also found a longer waiting list for pre-stented patients, resulting to be 86.5 days in period B compared to 64 days in period A ( $p < 0.005$ ).

**Conclusions:** Our study showed how COVID-19 caused a significant disruption in endourological services across the country. Our data underlined how less patients received treatment in a longer time. This can potentially lead to an increased risk of stone-related complications, including sepsis and kidney loss.