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Inferior pelvic calyceal radiological anatomy of the kidney: A retrospective study of Computer Tomographic evidence from a tertiary care unit in the Northern Province

Kathusan U¹, Stephanie BR¹, De silva MSHBJ¹, John Quinton RS¹, Balagobi B², Tharmalingam T³

¹Faculty of Medicine University of Jaffna

²Department of Surgery, Faculty of Medicine, University of Jaffna

³Department of Radiology, Teaching Hospital, Jaffna

Background and objective: Most kidney stones are located in the lower calyx, where removal can be challenging. Retrograde Intrarenal Surgery (RIRS), performed using a Flexible Ureterorenoscope (FURS), is a minimally invasive method for stone removal. The success of RIRS depends on renal anatomy, especially the Infundibulopelvic Angle (IPA), Infundibular Length (IL), and Infundibular Diameter (ID), which affect scope access and stone retrieval. This study aimed to estimate these parameters to provide reference values useful for planning RIRS by assessing renal Computer Tomographic parameters, including kidney dimensions, pelvicalyceal anatomy, and ureteric characteristics.

Methods: A descriptive retrospective study was conducted in the Radiology Department, Teaching Hospital Jaffna, using CT images of adult kidneys. Renal parameters—bipolar length, infundibular angle, infundibular length, diameter, and number of calyces were measured by investigators under consultant supervision, as these are not routinely reported. Convenience sampling was used until the required sample size was reached. Measurements were based on literature identifying their relevance to FURS success in lower pole stones. Data were analyzed using SPSS v21 with descriptive statistics and comparisons by age and sex to assess FURS eligibility.

Results: By studying the normal inferior pelvic calyceal anatomy, we measured the parameters such as ID, IL IPA, WDHU, BPL, LC, and TMC in normal kidneys to perform FURS according to values reported in the literature. Our study found that approximately 55.7% of patients met the expected criteria for directly contributing factors ID, IL, and IPA while around 65.86% of patients were within the reported ranges for indirectly contributing factors (WDHU, BPL, LC, and TMC). Furthermore, it was observed that individuals in the 25–54-year age group, particularly

Conclusion: We can proceed the FURS procedure for RIRS other than the SWL and PCNL among them according to our research. Recommendations are to enhance the success of FURS establishing radiological criteria, standardizing pre-operative imaging upgrading infrastructures, conducting comparative studies, ensuring proper patient counseling.

Keywords: infundibulopelvic angle, infundibular length, calyces, flexible ureterorenoscopy and retrograde intra-renal surgery