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MP73-02 PREDICTORS OF FINDING A STONE ON CT SCANS ORDERED FOR SUSPECTED NEPHROLITHIASIS

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MP73-01

NON-CONTRAST CT ATTENUATION VALUE OF RENAL PAPILLA IS A NOVEL PREDICTOR FOR RECURRENCE IN KIDNEY STONE DISEASE

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INTRODUCTION AND OBJECTIVES: In idiopathic calcium stone formers (ICSFs), most stones are known to grow attached to Randall's plaque, which can be identified by measuring computed tomography (CT) attenuation value of renal papilla. The purpose of the present study was to test the hypothesis that CT attenuation value of renal papilla can predict the severity and recurrence of the stone disease.

METHODS: We retrospectively reviewed the charts of ICSFs who underwent non-contrast CT scan from February 2005 to May 2012. Two observers independently measured the Hounsfield unit (HU) of the renal papilla from the upper pole, middle region and lower pole in both kidneys. Patients were classified into high- and low-HU value groups based on the mean HU values of all papillae. The median value was used for differentiation. Proportions of patients with severe disease (recurrent and/or multiple stones), urine chemistries and recurrence rates were compared between the groups.

RESULTS: A total of 134 patients, 89 men and 45 women, with at least one-year follow-up, were included in the analysis. Median HU value of all papillae was 49.3. The proportion of patients with recurrent and/or multiple stones was significantly higher in high-HU group compared to low-HU group (94.0% vs. 76.1%, $p < 0.01$). AP (CaOx) index in high-HU group was higher than that in low-HU group, although the difference was marginally significant ($p = 0.06$, Table 1). Recurrence rate in high-HU value group (0.62 person-year) was significantly higher than that of low-HU value group (0.09 person-year, $p < 0.01$). Multivariate analysis revealed that high-HU value was an independent predictor of stone recurrence (OR 8.48, 95% CI 3.45-22.88, Table 2).

CONCLUSIONS: These results demonstrated that the HU value of renal papilla was correlated with disease severity, AP (CaOx) index and recurrence in ICSFs. This may allow us to identify patients with a higher risk of recurrent stone formations and change the clinical management of these patients if necessary.

Table 1. Urine parameters (n=53)

	Low-HU group (< 48.3)	High-HU group (> 48.3)	p=
Volume, mL/day	1695±606	1674±841	0.91
Oxalate, mg/day	32.4±15.1	39.5±26.9	0.25
Calcium, mg/day	183.1±108.4	207.8±128.7	0.45
Uric acid, mg/day	585.3±187.3	499.7±223.1	0.14
Magnesium, mg/day	76.4±29.0	81.4±28.9	0.53
Citrate, mg/day	383.9±258.1	554.9±614.9	0.20
AP (CaOx)	0.811±0.494	1.191±0.865	0.06

Table 2. Multivariate analysis of stone recurrence (n=134)

	Odds ratio	95% confidence interval	p=
Age	0.95	0.90-0.98	<0.01
Male	1.76	0.68-4.70	0.24
Multiple stones	1.35	0.48-3.87	0.56
Recurrent stone former	0.88	0.31-2.39	0.81
Medication	3.98	1.51-11.07	<0.01
High-HU (≥49.3)	8.48	3.45-22.88	<0.01

Source of Funding: none

MP73-02

PREDICTORS OF FINDING A STONE ON CT SCANS ORDERED FOR SUSPECTED NEPHROLITHIASIS

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INTRODUCTION AND OBJECTIVES: To understand predictors of finding a stone on CT scans ordered for renal colic or suspected nephrolithiasis.

METHODS: A retrospective review was performed of all CT scans ordered for the following indications at University of California-San Francisco from 2007-2008. Inclusion criteria were CT scans ordered by emergency room physicians or primary care physicians with the following indications "renal colic," "history of kidney stones," "renal stone," "rule out renal stone." CT scans ordered by urologists were excluded from our analysis.

RESULTS: 384 patients met inclusion criteria. Urolithiasis was found on 173 CT scans (45.1%) whereas 211 CT scans (54.9%) failed to show any calculi. Of the 211 CT scans which did not show a stone, 183 (86.7%) showed no significant clinical findings whatsoever, while the remaining 28 (13.3%) showed other minor incidental findings. Factors associated with increased chance of finding nephrolithiasis on imaging were as follows: male gender (OR 2.61, 95% CI 1.72 to 3.97), emergency department as site of origin as opposed to primary care (OR 2.30, 95% CI 1.50 to 3.53), presence of hematuria on urinalysis (OR 3.20, 95% CI 1.86 to 5.81), presence of nitrites on urinalysis (OR 1.56, 95% CI 0.62 to 3.93), and prior history of urolithiasis (OR 3.27, 95% CI 1.46 to 7.30).

CONCLUSIONS: CT scans, with their associated cost and radiation exposure, should be used judiciously. By considering specific patient characteristics, clinicians may be able to better select patients for CT in whom findings are more likely.

Source of Funding: none

MP73-03

CHARACTERIZATION AND RECURRENCE RATES OF FIRST TIME STONE FORMERS IN THE ERA OF CT

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INTRODUCTION AND OBJECTIVES: The symptomatic recurrence rate for first time stone-formers is reportedly as high as 50% within 10 years. The published literature on which this rate was based pre-dated the CT era for stone detection, and we suspect that many of the stones later classified as "new" were indeed present at initial presentation. Given improved stone detection with CT, we hypothesized that the recurrence rate for first-time stone formers in the era of CT imaging is lower than previously estimated. We therefore sought to determine the symptomatic recurrence rate of first time stone-formers.

METHODS: We performed a retrospective review of first time adult stone-formers who underwent ureteroscopy at our institution from January 2009 to December 2011. Patients in whom follow-up was not available were contacted by phone and queried about the occurrence of documented symptomatic stone events. All patients had a baseline CT scan that determined the number of stones at presentation, and new stones were classified as symptomatic events with confirmatory imaging or spontaneous passage of a stone not previously detected radiographically. Patients with less than 1 year of follow up were excluded.

RESULTS: We identified 106 first time stone-formers with a mean age at first stone of 47.6 years (median 49, range 23-87 years). Female patients comprised a greater proportion of the group than male patients (59 [55.7%] vs. 47 [44.3%]). A medical condition predisposing to stone formation was present in 35.8% (38/106). In 65 patients, baseline chemistries were obtained, and at least 1 abnormality was identified in 73.8% (48) of patients. 24-hour urine collections were