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Predictors of Stone Free Rate Following Aggressive Ureteroscopy

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DISCLOSURES

- None

AIM AND METHODS

- Aim: To identify predictive factors for a stone-free state after ureteroscopy with aggressive stone basketing as determined by CT

- Prospective single-institution study of all patients undergoing URS for renal or ureteral calculi between 12/2015 and 2/2017 by one of 2 fellowship trained endourologists
- CT abdomen/pelvis was obtained 6-8 weeks post-procedure
  - Fragments of any size were considered residual
- Patient demographics, stone characteristics and operative parameters were evaluated
- Univariate and multivariate binary logistic regression modeling was performed ($p<0.05$)

RESULTS

Renal Units	210
Median Age (yrs) (IQR)	59 (50-66)
Gender	
Male	119 (57%)
Female	91 (43%)
Race	
Caucasian	183 (87%)
Other	27 (13%)
Ethnicity	
Latinx	10 (5%)
Median BMI (kg/m^2) (IQR)	29.8 (26.1-33.5)
ASA	
1	9 (4%)
2	128 (61%)
3	64 (31%)
4	7 (3%)
Pre-Ureteroscopy Imaging	
Median number of stones (IQR)	2 (1-4)
Median Aggregate Stone Diameter (cm) (IQR)	1.2 (0.80-1.90)
Primary Stone Side	
Right	91 (43%)
Left	119 (57%)
Primary Stone Location	
Upper Pole Calyx	31 (15%)
Mid Pole Calyx	18 9%)
Lower Pole Calyx	55 (26%)
Renal Pelvis	24 (11%)
Ureteropelvic Junction	15 (7%)
Ureter	67 (32%)
Median Houndsfeld Units (IQR)	814 (553-1079)

Intra-Operative Details	
Pre-Stented Renal Units	28 (13%)
Access Sheath Use	197 (94%)
Bilateral Procedure	84 (40%)
Median Operative Time (min) (IQR)	112 (75-152)
Median Ureteroscope Passes (IQR)	36 (17-60)
Post-Ureteroscopy Imaging	
Stone Free Renal Units	115 (55%)
Median number of stones (IQR)	1 (1-3)
Median Largest Fragment Diameter (cm) (IQR)	0.3 (0.2-0.5)
Primary Stone Composition	
Calcium Oxalate Monohydrate	165 (79%)
Calcium Oxalate Dihydrate	4 (2%)
Calcium Phosphate	16 (8%)
Uric Acid	10 (5%)
Struvite	2 (1%)
Cystine	2 (1%)

	Univariable			Multivariable		
Variable (referent)	**OR**	**95% CI**	**p**	**OR**	**95% CI**	**p**
Demographics						
Age (per 1 year)	0.997	0.977-1.017	0.735			
Female gender (male)	1.013	0.585-1.753	0.963			
Race (cat)	-	-	0.754			
BMI (per 1 unit increase)	1.022	0.980-1.066	0.301			
ASA score (cat)	-	-	0.941			
Pre-URS Stone Characteristics						
Stone Number (per 1 stone increase)	0.739	0.646-0.846	**<0.001**	0.772	0.658-0.906	**0.002**
Aggrigate Stone Size (per 1 mm increase)	0.684	0.515-0.910	**0.009**	0.964	0.724-1.285	0.805
Left Primary Stone Side (right)	1.154	0.667-1.997	0.608			
Primary Stone Location (renal pelvis)						
Upper pole calyx	0.697	0.239-2.032	0.508			
Mid pole calyx	0.677	0.198-2.312	0.534			
Lower pole calyx	0.705	0.269-1.846	0.477			
UPJ	2.327	0.575-9.417	0.236			
HU (per 100 unit increase)	0.956	0.894-1.021	0.181			
Intra-opeartive Characteristics						
Pre-URS stent in place (No stent)	1.911	0.821-4.449	0.133			
Access sheath use (No sheath)	2.289	0.590-8.885	0.231			
Bilateral (unilateral)	0.726	0.417-1.265	0.258			
OR Time (per 10 min increase)	0.935	0.887-0.987	**0.014**	0.998	0.992-1.005	0.595
Trips up the sheath (per 1 trip increase)	0.994	0.987-1.002	0.131			
Primary Stone Composition (CaOxM)						
CaOx Dihydrate	2.211	0.225-21.701	0.496			
Calcium Phosphate	0.246	0.076-0.794	**0.019**	0.300	0.088-1.027	0.055
Uric Acid	1.105	0.301-4.065	0.880			
Strivite	0.000	-	0.999			
Cystine	0.737	0.045-11.984	0.830			

Conclusions:

- Stone multiplicity significantly predicted a lower stone free rate and composition primarily of calcium phosphate trended to significance
- Diligent extraction or alternative modalities should be considered in these patients

Thank you