



A PROSPECTIVE COMPARATIVE EVALUATION OF THE DIFFERENT PRE-OPERATIVE STONE SCORING SYSTEMS WITH RESPECT TO STONE FREE RATE (SFR) AND COMPLICATIONS IN PERCUTANEOUS NEPHROLITHOTOMY (PCNL)



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INTRODUCTION

- PCNL outcomes among the authors are different, because of the vast heterogeneity in the methods for clinical and academic characterization of nephrolithiasis besides the evaluation of surgical outcomes. So assessing the preoperative factors that affect SFR (Stone Free Rate) and complications is critical.^[1]
- Few **nephrolithotomy scoring systems** based on preoperative parameters have been suggested to better counsel patients contemplating PCNL.
 - The **Guy's stone score (GSS)**
 - The Clinical Research Office of the Endourological Society (**CROES**) nomogram and
 - The **S.T.O.N.E.** (stone size, tract length, obstruction, number of involved calices and essence) **score**
- These **nephrolithotomy scoring systems** are seen as predictors of **stone-free status (SFS)** and complications after PCNL.^[2]
- However, no universally accepted stone scoring system for predicting SFR and complications after PCNL exists.
- Comparison of the SSSs in different clinical studies indicated some advantages as well as disadvantages of one nomogram to another for different variables

Material & Methods

Study area – Department of Urology, IPGME&R and SSKM Hospital Kolkata.

Study population – Cases admitted and operated in department of Urology for Nephrolithiasis by PCNL.

Study period - from November 2019 to December 2020

Sample size – Total 100 patients

Study design – Prospective observational study.

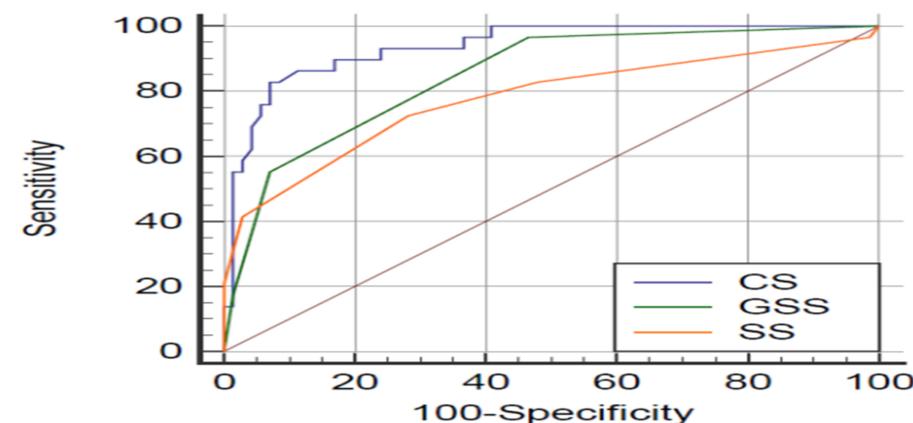
Study tools – Routine investigations including Preoperative NCCT scan

Inclusion criteria: - Patient undergoing PCNL aged ≥ 12 years

Exclusion criteria:

- Patients who are unfit to undergo general anaesthesia
- Patients with a nephrostomy tube in ipsilateral kidney placed preoperatively.

Results



ROC for scoring systems for predicting SFS

Scoring systems	Labadie et al. [39]			Tailly et al. [45]			Present study		
	Grade or score range	Stone-free patients	AUC	Grade or score range	Stone-free patients	AUC	Grade or score range	Stone-free patients	AUC
Guy's stone score	I	70.2%	0.634	I	80.3%	0.629	I	97.8%	0.847
	II	65.4%		II	73.8%		II	75.8%	
	III	48.1%		III	60.5%		III	41.6%	
	IV	35.9%		IV	52.3%		IV	23%	
S.T.O.N.E. score	5-6	70.6%	0.670	5-6	82.1%	0.671	5-6	91.3%	0.774
	7-8	66.3%		7-8	72.7%		7-8	75%	
	9-13	46.2%		9-13	48.9%		9-13	22.2%	
CROES nomogram	≤ 150	22.7%	0.671	≤ 150	44.4%	0.646	≤ 150	21.4%	0.936
	150-219	46.4%		150-219	64.4%		150-219	46.1%	
	≥ 220	72.7%		≥ 220	84.2%		≥ 220	90.4%	

DISCUSSION

1. The overall **Stone Free Rate (SFR)** in the study is **75%** after PCNL performed for the first time.
2. The SFR is significantly higher in the cases with **high CROES score and low Guy's score and low S.T.O.N.E. score.**
3. All the scoring systems can efficiently predict SFR. The **CROES score** is more accurate in predicting SFS than other two systems.
4. The **procedure time, scope time and fluoroscopy time** were significantly higher in patients with low CROES score and high Guy's score and STONE score.
5. Post-operative complications according to the **modified Clavein-Dindo Grading system is NOT significantly related to Guy's score system.**
6. None of the scoring systems can predict length of hospital stay.

Conclusion

- **Nephrolithometry scoring systems** are simple easily reproducible systems to classify the severity of nephrolithiasis and to stratify the complexity of PCNL.
- These help in better patient counseling preoperatively and in predicting the need for ancillary treatment.

References:

1. Turk C, Petrik A, Sarica K, Seitz C, Skolarikos A, Straub M, Knoll T. EAU guidelines on interventional treatment for urolithiasis. Eur Urol 2016 ;69 :475–82.
2. Smith A, Averch TD, Shahrour K, Opondo D, Daels FP, Labate G, Turna B, de la Rosette JJ, Group CPS. A nephrolithometric nomogram to predict treatment success of percutaneous nephrolithotomy. J Urol 2013;190 :149–56.