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The aims of this study were:

- (1) to design a standardised and original classification system of kidney stones suitable for RIRS based on their features and on the anatomical aspect of the upper urinary tract (**ScorDiS-RIRS**: *Scoring Difficulties for Stones*“-RIRS”);
- (2) to evaluate the ability of this classification system in predicting the “complexity” of performing RIRS on a prospective series of patients.

In order to propose a reliable, simple and “objective” predictive score of operative difficulty for RIRS we based our analysis on the correlations between preoperative objective parameters and a self-assessment of “technical difficulty” performed by a single skilled surgeon. 🟡

We **prospectively** evaluated **108** patients who underwent RIRS for renal stones between May and December 2016. All procedures were performed by the same skilled surgeon (PB).

Preoperatively, all patients were studied using computed tomography (CT) or magnetic resonance imaging (MRI).

For each patient data regarding the age, size of stone, location, composition/hardness (according to Hunsfield Units at imaging), number of stones, previous or not ureteral procedures, presence or not of ureteral stent “in situ” were collected.

Operative time and intra/postoperative complications according to Clavien-Dindo classification were recorded.

Definitions of different morphologies of the upper urinary tract

We evaluated **the upper urinary tract morphology** identifying five possible “silhouettes” (see Figure):

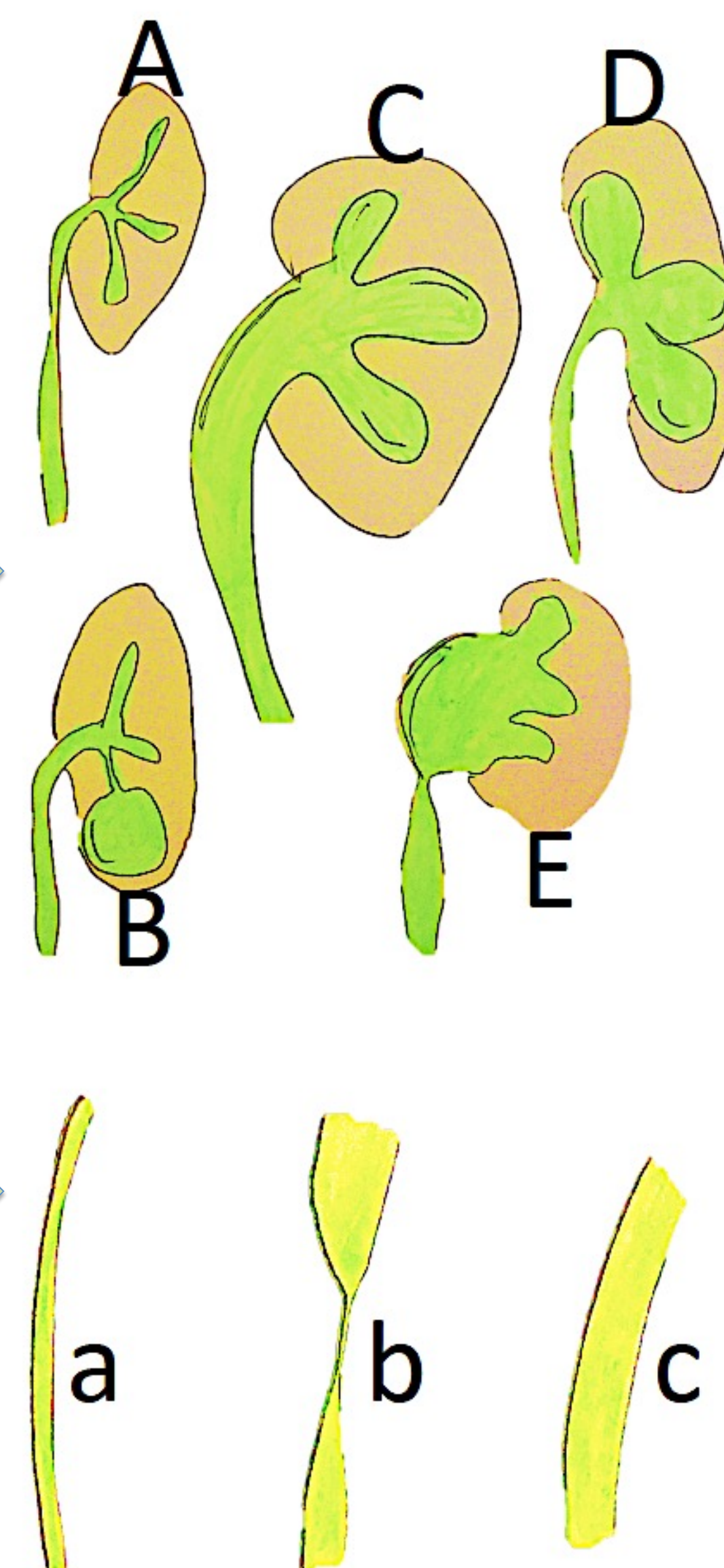
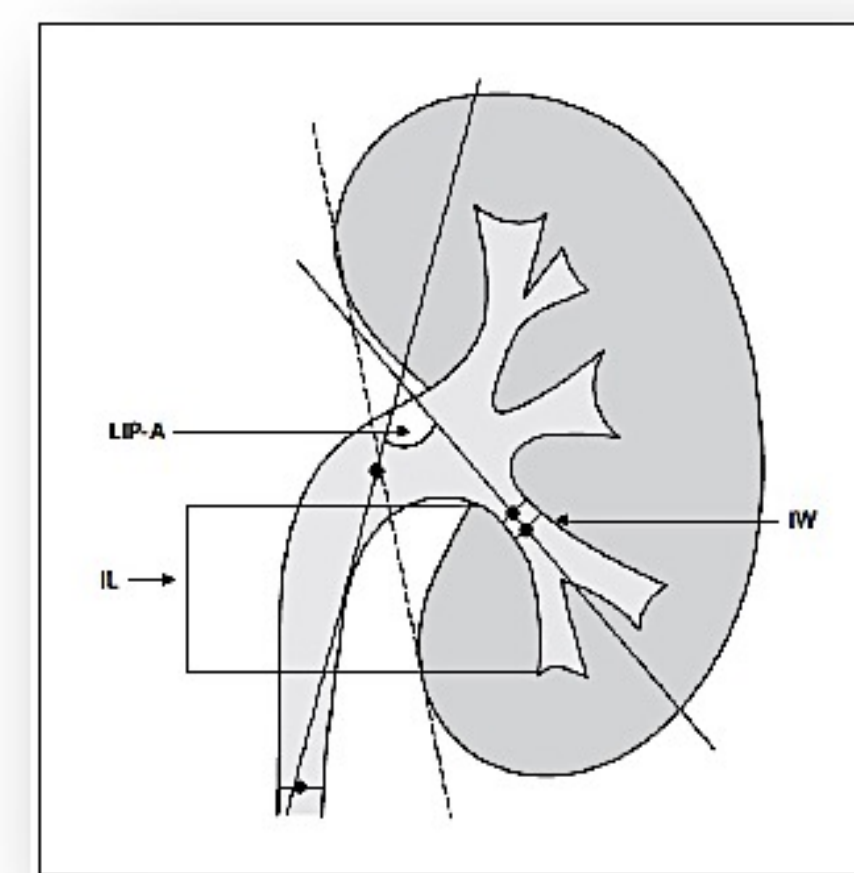
- A:** normal;
B: Caliceal diverticulum;
C: dilation of calices, pelvis and ureter;
D: dilation of only calices;

E: hydronephrosis (with ureteropelvic junction obstruction).

We also analysed **the ureteral morphology**, with three possibilities:

- a:** normal ureter;
b: ureteral stricture;
c: ureteral dilation.

The surgeon (PB) was asked to assign (immediately at the end of each procedure) a degree of “difficulty”, classifying each RIRS as “easy”, “intermediate” or “difficult”, according to his experience.



Parameter	Score	1	2	3
Size	<10 mm	●		
	10-20 mm		●	
	>20 mm		●	
Location	C1 Upper		●	
	C2 Middle	●		
	C3 Lower	●		●
		LIPa ≥ 70°		LIPa < 70°
	Pelvis		●	
Composition	< 500 HU	●		
	>500 HU		●	
Number	1	●		
	>1		●	
Upper Tract	A	●		
	B	●		
	C		●	
	D			●
	E		●	
Ureter	a		●	
	b			●
	c	●		

Difficulty:
1 2 3

ScorDiS – RIRS:

**UPDATED
DATA**

Parameter	<i>p</i>
Age	<i>p</i> =0.3844*
Size	<i>p</i> = 0.0002*
Location	<i>p</i> =0.0013 [#]
Hardness	<i>p</i> =0.0006*
Number	<i>p</i> =0.0471*
Upper Urinary Tract Morphology	<i>p</i> =0.0001*
Ureteral Morphology	<i>p</i> =0.0028 [#]
Re-operation	<i>p</i> =0.1422*
Presence of DJ in situ	<i>p</i> =0.6261*
	* Yeats' χ^2 - [#] Fisher's test

ScorDiS – *RIRS* Groups

ScorDis Groups	Complexity		
	Easy	Intermediate	Difficult
1 (<10)	68.2%	31.8%	0%
2 (10-11)	28.6%	48.6%	22.8%
3 (>11)	0%	41.4%	58.6%
			<i>p</i> < 0.00001

With this preliminary analysis, we demonstrated that **ScorDis-RIRS** is a simple scoring system that can be used to predict the complexity of RIRS procedure.

Further experiences are needed to validate this scoring system.

ScorDis-RIRS could also be useful in training programs for selecting a surgeon with an appropriate level of expertise, and thereby avoiding assigning a resident surgeon in training (without the necessary level of skill) to an overly complex case.

