

ULTRASOUND BASED SCORING SYSTEM FOR EARLY INDICATION OF PYELOPLASTY IN PATIENTS WITH UPJO-LIKE

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BACKGROUND

- No standard set of indications for pyeloplasty
 - Many use differential renal scintigraphy to evaluate¹
 - Scoring of UPJO-like with solely ultrasound has not been described

OBJECTIVE

To evaluate a **pyeloplasty indication scoring system (PISS)**, which utilizes only baseline ultrasound measurements to predict the likelihood of pyeloplasty in infants with UPJO-like

PYELOPLASTY INDICATION SCORING SYSTEM (PISS)-SFU GRADES

A. SFU grading of affected kidney on ultrasound	
0	Normal
1	SFU Grade 1
2	SFU Grade 2
3	SFU Grade 3
4	SFU Grade 4

PYELOPLASTY INDICATION SCORING SYSTEM (PISS)-APD

B. APD measurement of affected kidney on ultrasound	
0	< 5 mm
1	5-10 mm
2	11-15 mm
3	16-19 mm
4	≥ 20 mm

PYELOPLASTY INDICATION SCORING SYSTEM (PISS)- RELATIVE RENAL LENGTH (RRL)

C. Absolute percentage difference between the ipsilateral and contralateral renal lengths
|[100% *(Ipsilateral Renal Length- Contralateral Renal Length)/Ipsilateral Renal Length]|

0 < 5%

1 5%-10%

2 11%-15%

3 16% -19%

4 ≥ 20%

ULTRASOUND SCORING PARAMETERS FOR PYELOPLASTY

Pyeloplasty Indication Scoring System - **PISS**

$A + B + C \rightarrow \text{PISS } 0-12$

METHODS

Analysis of a prospectively collected Prenatal Hydronephrosis database

- 928 infants initially identified – Operative indications (Poor/Worsening MAG3, Symptomatic, Worsening US)
- Two pediatric Urologists between 2008-2018 in Hamilton, Ontario, Canada
- Patients excluded if
 1. VUR, primary megaureter, bilateral hydronephrosis, other anatomic abnormalities
 2. follow-up less than 3 months, US measurements not all present

Analysis – Primarily Sensitivity/Specificity analysis revealing

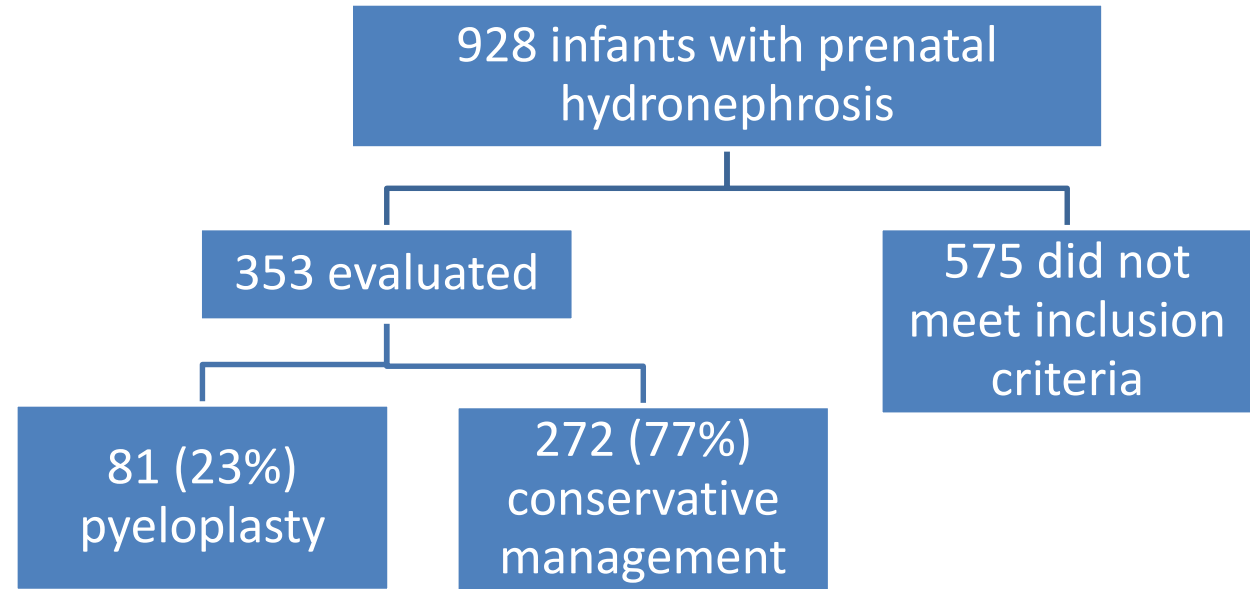
1. Receiver operating characteristic – AUC
2. LRs

DEMOGRAPHIC

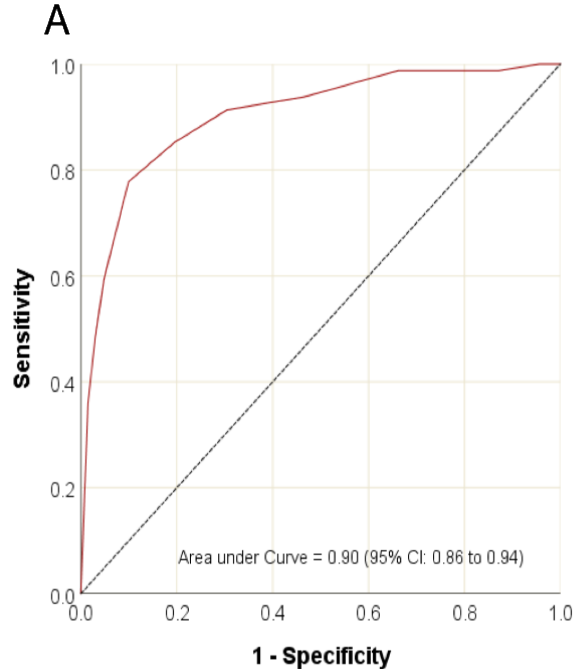
Male : Female
11:3

Median Age at initial consultation
3 months

UPJO-like laterality
268 left (76%)



ULTRASOUND SCORING PARAMETERS FOR PYELOPLASTY

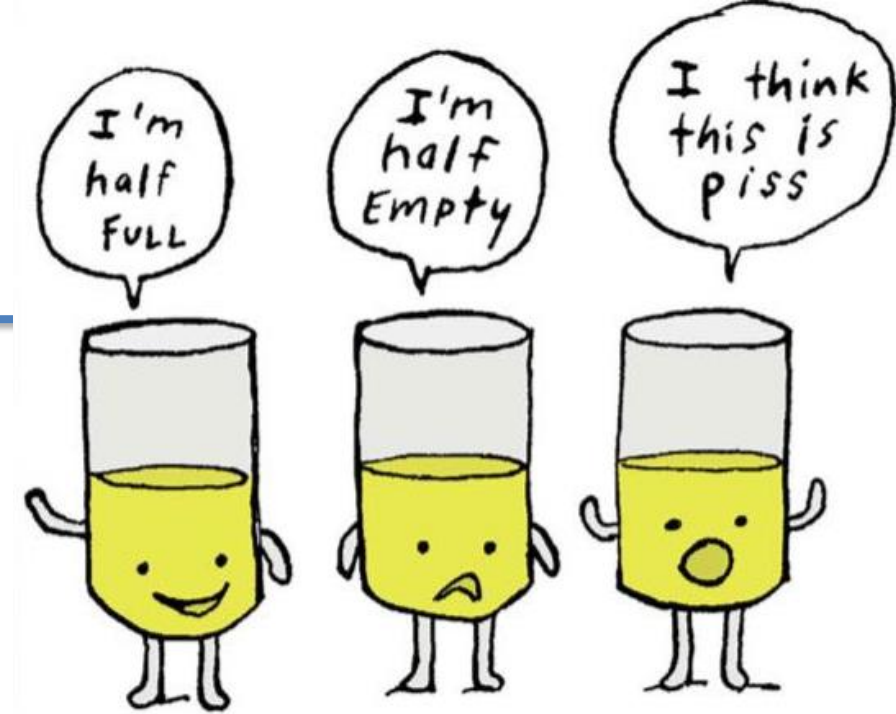
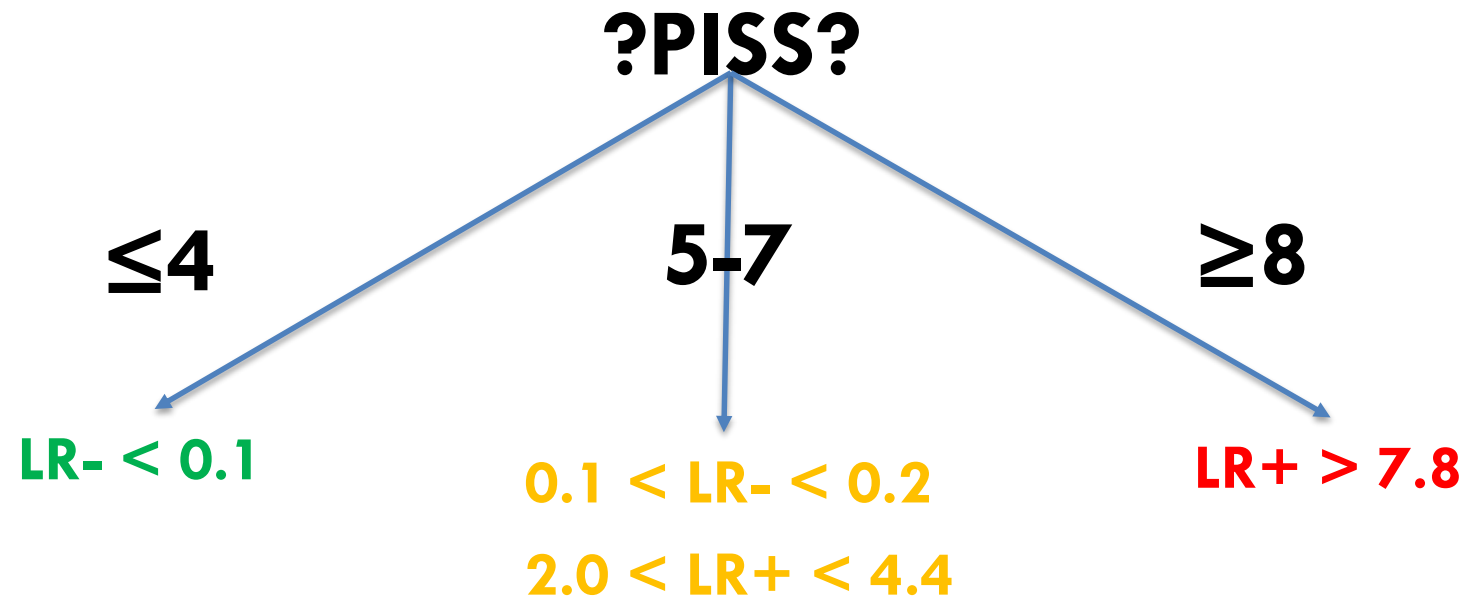


Study	TP	FP	FN	TN	Sensitivity (95% CI)	Specificity (95% CI)	Sensitivity (95% CI)	Specificity (95% CI)	LR+	LR-	Study
PISS Score 01	81	272	0	0	1.00 [0.96, 1.00]	0.00 [0.00, 0.01]			1.0	NA	PISS Score 01
PISS Score 02	81	260	0	12	1.00 [0.96, 1.00]	0.04 [0.02, 0.08]			1.0	0.0	PISS Score 02
PISS Score 03	80	237	1	35	0.99 [0.93, 1.00]	0.13 [0.09, 0.17]			1.1	0.1	PISS Score 03
PISS Score 04	80	180	1	92	0.99 [0.93, 1.00]	0.34 [0.28, 0.40]			1.5	0.0	PISS Score 04
PISS Score 05	76	127	5	145	0.94 [0.86, 0.98]	0.53 [0.47, 0.59]			2.0	0.1	PISS Score 05
PISS Score 06	74	83	7	189	0.91 [0.83, 0.96]	0.69 [0.64, 0.75]			3.0	0.1	PISS Score 06
PISS Score 07	69	53	12	219	0.85 [0.76, 0.92]	0.81 [0.75, 0.85]			4.4	0.2	PISS Score 07
PISS Score 08	63	27	18	245	0.78 [0.67, 0.86]	0.90 [0.86, 0.93]			7.8	0.2	PISS Score 08
PISS Score 09	48	13	33	259	0.59 [0.48, 0.70]	0.95 [0.92, 0.97]			12	0.4	PISS Score 09
PISS Score 10	39	8	42	264	0.48 [0.37, 0.60]	0.97 [0.94, 0.99]			16	0.5	PISS Score 10
PISS Score 11	29	4	52	268	0.36 [0.25, 0.47]	0.99 [0.96, 1.00]			24	0.7	PISS Score 11
PISS Score 12	15	2	66	270	0.19 [0.11, 0.29]	0.99 [0.97, 1.00]			25	0.8	PISS Score 12

CONCLUSION

The **PISS** is able to effectively distinguish between patients treated operatively and non-operatively based on baseline ultrasound characteristics

Conclusion - Stratification



Reference

1. Sarin, Y.K. Indian J Pediatr (2017) 84: 531. <https://doi.org/10.1007/s12098-017-2346-9>