

ULTRASONOGRAPHIC HYDRONEPHROSIS-TO-PARENCHYMA AREA RATIO IN THE FOLLOW-UP OF CHILDREN AFTER PYELOPLASTY

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Conflict of Interest: none to disclose

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Introduction

- **Study Rationale:**
 - Success after pyeloplasty, resolution of UPJ obstruction (UPJO), is determined by assessing improvement of imaging parameters.
 - Serial ultrasounds (US) assess hydronephrosis
 - Diuretic renography (MAG3) more commonly done in specific cases where US is concerning
- **Study Objective:**
 - To assess the hydronephrosis-to-parenchyma area (HPA) ratio as a more objective tool to predict success after pyeloplasty for UPJO



Image J

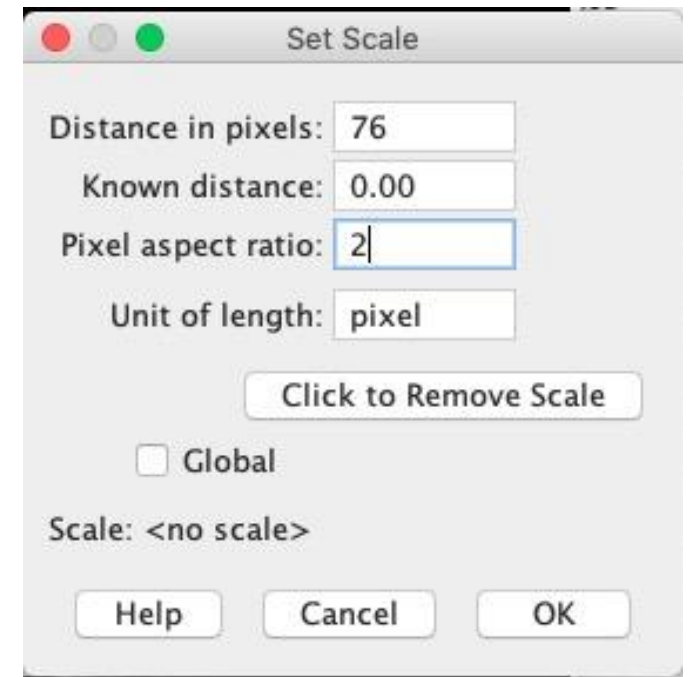
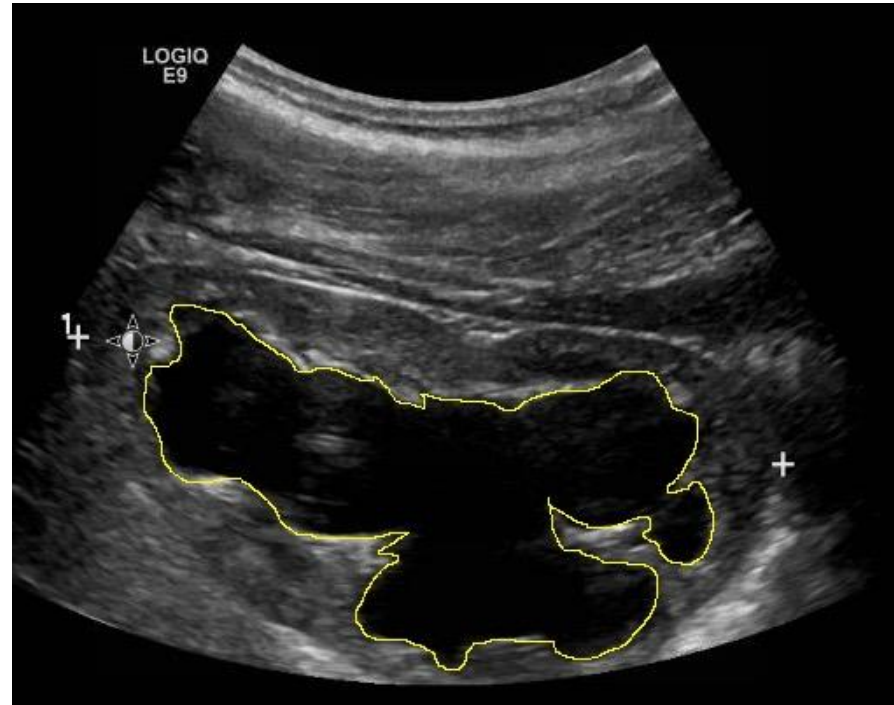
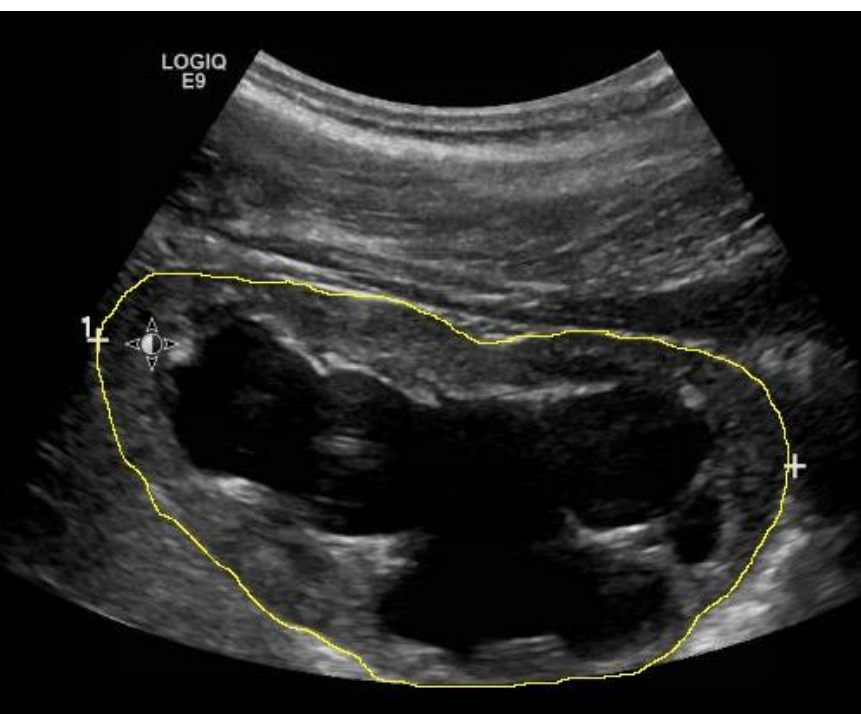




Image J



Results				
	Area	Mean	Min	Max
1	68805	33.424	0	242
2	35654	9.525	0	194

23.9 cm = Parenchyma Area

$$9.52/23.9 = 0.40$$

HPA

Results

110 RALP



39 unavailable imaging



71 analyzed patients (190 HPA ratios)



Preop US



1st postop US



Last postop US*

Age at pre-op US (months)	87.53 [47.5-141.46]
Hydronephrosis area (cm ²)	22.05 [12.25-32.32]
Parenchymal area (cm ²)	23.91 [17.03-37.8]
HPA ratio	0.85 [0.53-1.48]

Median [interquartile range].

US after surgery (months)	3.63 [2.4-5.33]
Hydronephrosis area (cm ²)	6.9 [2.29-12]
Parenchymal area (cm ²)	23.3 [19.7-32]
HPA ratio	0.30 [0.09-0.54]

Median [interquartile range].

US after surgery (months)	20.73 [11.45-30.85]
Hydronephrosis area (cm ²)	4.36 [1.14-10.02]
Parenchymal area (cm ²)	27.27 [22.97-34.36]
HPA ratio	0.13 [0.04-0.26]

Median [interquartile range].

* 48 patients analyzed.

Results

2.5 yo M with Rt UPJO

Preop US

HPA ratio

0.48



1st postop US, 7 weeks after stent removal

HPA ratio

0.72



Last postop US (22 months postop)

HPA ratio

0.02



Results

6 yo M with Lt UPJO

Preop US

HPA ratio

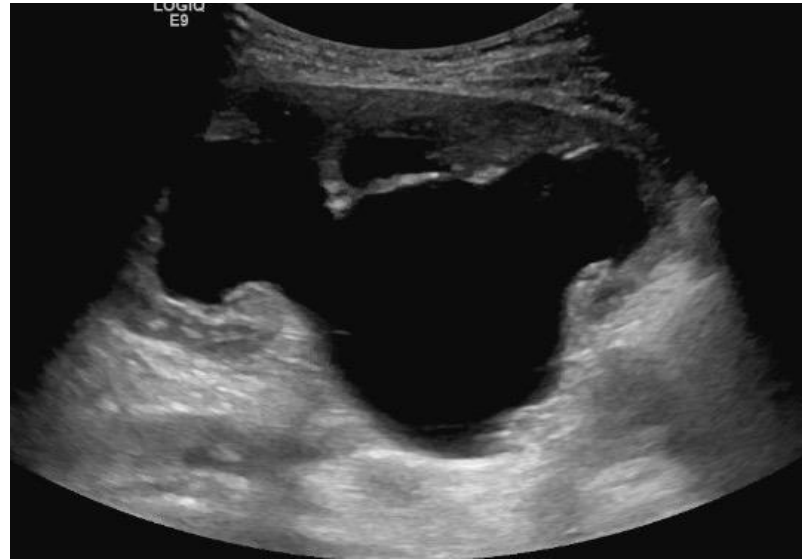
0.57



1st postop US, 3 weeks after stent removal

HPA ratio

2.21



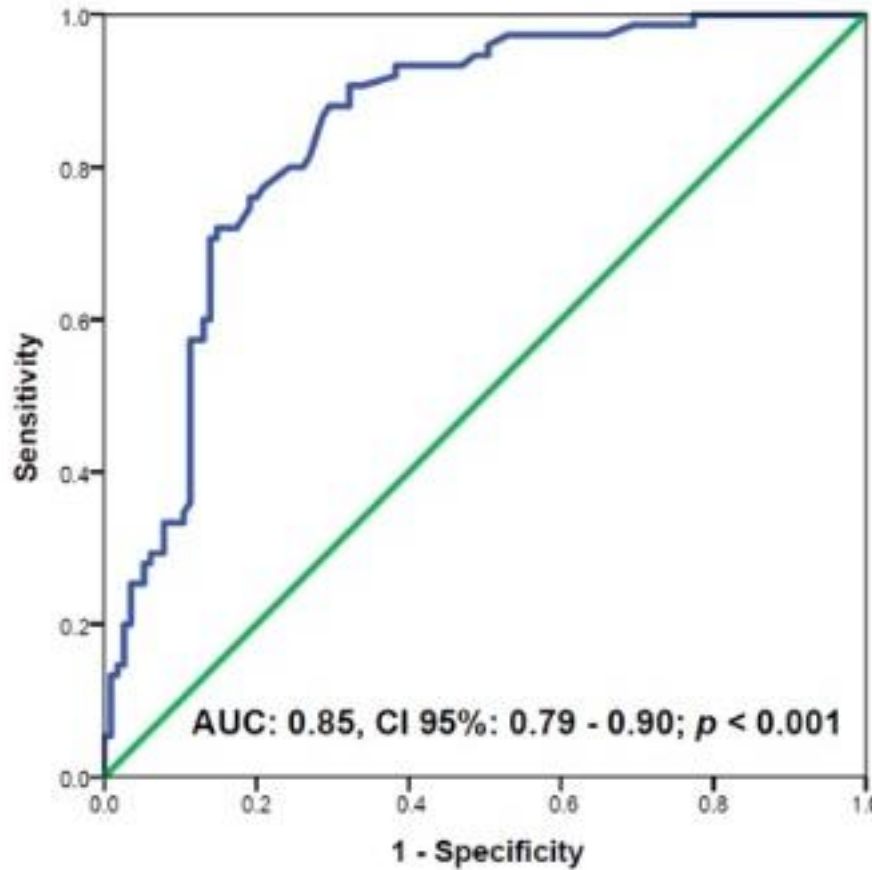
Last postop US

HPA ratio

0.43



Results



HPA	Sensitivity	Specificity	PPV	NPV
> 1	0.36	0.89	0.68	0.68
> 0.9	0.43	0.89	0.71	0.70
> 0.8	0.52	0.89	0.75	0.74
> 0.7	0.61	0.86	0.74	0.77
> 0.6	0.71	0.86	0.77	0.82
> 0.55*	0.72	0.85	0.76	0.82
> 0.5	0.76	0.81	0.72	0.84
> 0.45	0.80	0.76	0.68	0.85
> 0.4	0.81	0.73	0.66	0.86
> 0.35	0.88	0.70	0.65	0.90

Conclusion

- The HPA ratio is a very good tool to objectively assess hydronephrosis in children who underwent RALP.
- It can aid in tailoring which patient may need a postop MAG3.
- It can be used to predict surgical success.

Thank you.

