



Imaging Follow-up after stone  
treatment:  
KUB and Ultrasound are NOT  
enough

Vernon M. Pais Jr

Dartmouth Hitchcock Medical Center

Geisel School of Medicine



# What's the current status of postop imaging

## Post SWL

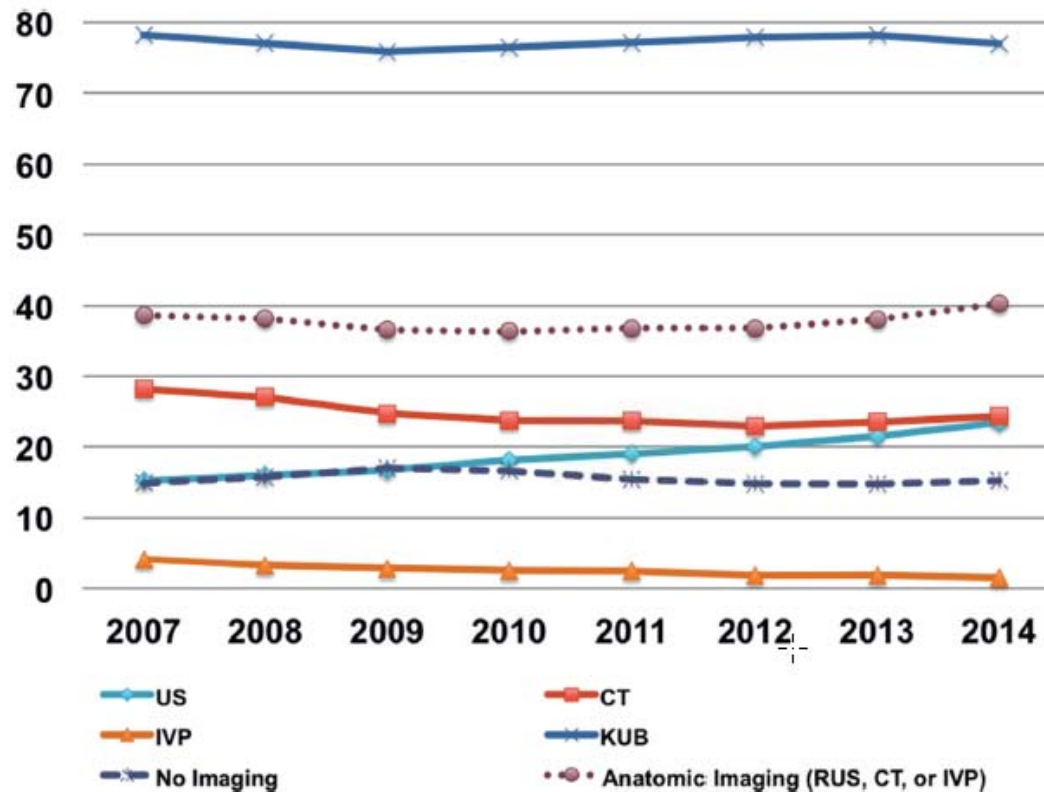


Figure 7. Annual imaging rate percent after SWL

# Postoperative imaging – why bother?

	KUB	U/S	CT
Assess for postoperative injuries			
Assess for residual hydronephrosis			
Assess for residual fragments			

# Postoperative imaging – why bother?

	KUB	U/S	CT
Assess for postoperative injuries			<b>X</b>
Assess for residual hydronephrosis			
Assess for residual fragments			

# Postoperative imaging – why bother?

	KUB	U/S	CT
Assess for postoperative injuries			<b>X</b>
Assess for residual hydronephrosis		<b>X</b>	<b>X</b>
Assess for residual fragments			

# Postoperative imaging – why bother?

	KUB	U/S	CT
Assess for postoperative injuries			X
Assess for residual hydronephrosis		X	X
Assess for residual fragments			

# Residual Fragments

## Natural History of Residual Fragments After Percutaneous Nephrolithotomy: Evaluation of Factors Related to Clinical Events and Intervention



Daniel Olvera-Posada, Sohrab Naushad Ali, Marie Dion, Husain Alenezi, John D. Denstedt, and Hassan Razvi

<b>OBJECTIVE</b>	To determine the natural history of residual fragments (RF) after percutaneous nephrolithotomy in long-term patient follow-up and to identify possible predictive factors for future intervention.
<b>MATERIALS AND METHODS</b>	We assessed all patients from 2006 to 2013 with postoperative computed tomography scan revealing RF, who did not undergo second-look nephroscopy or immediate ancillary procedures, and with at least 12 months of clinical follow-up. We evaluated factors associated with clinical, radiological, and surgical outcomes. Kaplan-Meier curves were used to calculate the proportion of asymptomatic and treatment-free patients during follow-up.
<b>RESULTS</b>	From 781 percutaneous nephrolithotomies performed, 202 patients underwent postoperative computed tomography scan and 44 patients with residual stones were included in the analysis. Mean follow-up was 57.9 months. A total of 24 patients (54.5%) developed at least 1 clinical outcome, and 32 (72.7%) patients had a surgical intervention. Only 4 patients had radiological evidence of stone passage. Multivariate analysis found that RF >4 mm and struvite or apatite stones were significant predictors for surgical intervention. The 5-year estimated probability to remain intervention free was 29%.
<b>CONCLUSION</b>	Despite the size of the RF, the vast majority of patients required an intervention during long-term follow-up. We identified that RFs of diameter >4 mm associate with the need for a surgical therapy, but the rate of clinical events was not affected by the size or location of the stones. Struvite or apatite composition stones had an increased risk of intervention during follow-up. Spontaneous passage was an uncommon event in this cohort. UROLOGY 97: 46–50, 2016. © 2016 Elsevier

# Event rates for Residual Fragments

- **URS** >4mm 59% after 1.4 yrs Chew 2016  
<4mm 28% after 1.4 yrs Chew 2016
- **PNL** <4mm 26% after 2.3 yrs Altunrede 2011  
73% at 5 years Olvera-Posada 2016
- **SWL** 21-59% after 5 yrs Khaitan 2002, Osman2005



- Residual fragments do cause problems
- .... KUB and Ultrasound fail to identify many fragments

# Residual Fragments

