



PNL Access: Always Combined Ultrasound and Fluoroscopy!

NO

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Percutaneous Access

Fluoroscopy versus Ultrasound



- Fluoroscopy has been used for access during percutaneous nephrolithotomy for over 30 years¹
- In 2013, results from the international CROES PCNL registry demonstrated:
 - Fluoroscopy was used in 2853 pts (86%) vs ultrasound in 453 pts (14%)²

1. Lowe FC, Urology 1986

2. Andonian, S et al. J Endourol 2013



Percutaneous Access

Fluoroscopy versus Ultrasound



- Ultrasound has grown in popularity due to radiation concerns
- Systematic reviews and meta-analysis have shown ultrasound guided access associated with:
 - Equivalent or better stone free rates
 - Shorter access times
 - Lower complications
 - Less bleeding

1. Liu Q, et al. Urolithiasis 2017
2. Wang K, et al. Urol Int 2015
3. Breda A, et al. Scand J Urol 2017



Percutaneous Access

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Radiation Reduction

Ultrasound during PNL

	Ultrasound + Fluoroscopy	Fluoroscopy	p Value
Basiri A, et al.	41.4 s	57.0 s	p=0.0001
Agarwal M, et al.	14.4 s	28.6 s	p<0.01

Basiri A, et al. J Endourol 2008
Agarwal M, et al. BJU Int 2011



Percutaneous Access

Fluoroscopy versus Ultrasound



- Should we be using ultrasound in every case?
- Less radiation



... case?
...



Percutaneous Access

Fluoroscopy versus Ultrasound



- With ultrasound, as depth increases resolution decreases
- Many series of PNL have median BMI > 30 kg/m²

1. Astroza G Int Urol and Neph 2011
2. York, N. J Endourol 2016



Percutaneous Access

Fluoroscopy versus Ultrasound



Ultrasound Guidance to Assist Percutaneous Nephrolithotomy Reduces Radiation Exposure in Obese Patients

Manint Usawachintachit, Selma Masic, Helena C. Chang, Isabel E. Allen, and Thomas Chi

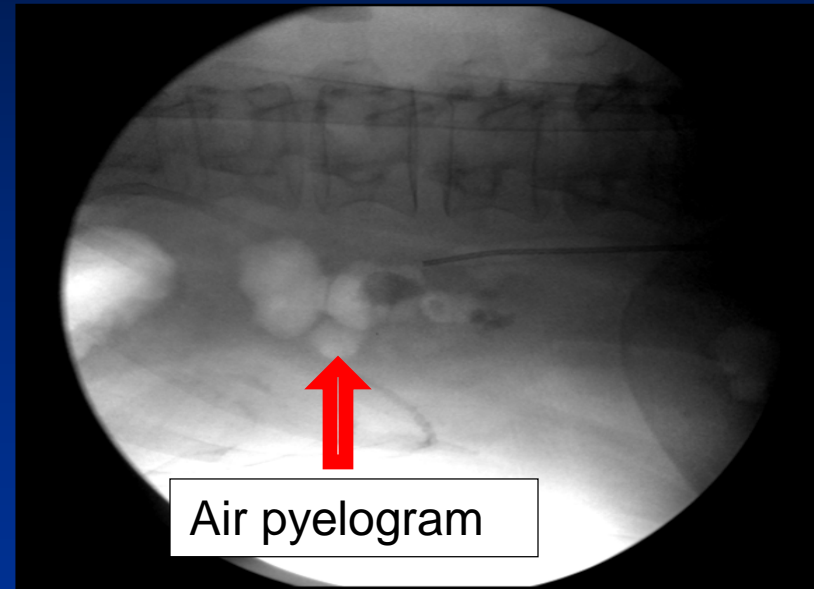
- Demonstrated **45.7%** success rate for ultrasound guided access in obese patients
 - Significantly lower than in normal weight patients



Radiation Reduction

Obese patients without Ultrasound

- Air pyelogram shown to reduce radiation exposure by ~ 50%
 - Median BMI 31.6





Radiation Reduction



Fluoroscopy protocol-obese patients

- Reduced fluoroscopy protocol
 - Pulse rate set at 1 frame/sec
 - Timed fluoro at expiration
 - Measured tract length on pre-op CT
- Mean BMI > 30
- Reduced fluoro time from 175.6 sec to 33.7 sec



Percutaneous Access

Fluoroscopy versus Ultrasound

- Should use
access in



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