



Thulium Laser Lithotripsy in Supine Mini-PCNL: Safe and Effective

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Thulium Laser Lithotripsy in Supine Mini-PCNL

Disclaimer

- Olympus (Tokyo, Japan) Soltive™ SuperPulsed Thulium Laser
 - Provided to institution on a trial basis

Thulium Laser Lithotripsy in Supine Mini-PCNL

Overview

- Initial experience with Thulium fiber Supine Mini-PCNL in North America
- Karl Storz (Tuttlingen, Germany) Minimally Invasive PCNL System
- Thulium Laser Fiber
 - Olympus (Tokyo, Japan) Soltive™ SuperPulsed Laser

Thulium Laser Lithotripsy in Supine Mini-PCNL

Supine Mini-PCNL Access

- US or cross-table fluoroscopy
- Karl Storz (Tuttlingen, Germany)
Minimally Invasive PCNL System
17.5F reusable sheath



Thulium Laser Lithotripsy in Supine Mini-PCNL

Supine Mini-PCNL Access

- US or cross-table fluoroscopy
- Karl Storz (Tuttlingen, Germany)

Minimally Invasive PCNL System

17.5F reusable sheath

- 2-3cm incision closed with subcuticular absorbable monofilament suture



Thulium Laser Lithotripsy in Supine Mini-PCNL

Thulium SuperPulsed Laser

- Smaller device
- Smaller fibers
- Standard 110volt electric outlet
- Beyond 2,000Hz possible
- Excellent dusting capabilities

Thulium Laser Lithotripsy in Supine Mini-PCNL

Methods

- Two institution consecutive series of Supine Mini-PCNL with Thulium Fiber Laser
 - Olympus (Tokyo, Japan) Soltive™ SuperPulsed Laser
 - Karl Storz (Tuttlingen, Germany) Minimally Invasive PCNL System
- Stones cleared through nephrostomy sheath until visual and fluoroscopic clearance
- Technique and management maintained at institutional standard

Thulium Laser Lithotripsy in Supine Mini-PCNL

Baseline Characteristics

Table 1. Baseline characteristics of patients undergoing Mini-PCNL with Thulium Laser Lithotripsy				
Patient Characteristic	#	Mean	Range	SD
Patients	15			
Age (Years)		58	27-84	19
BMI		33	24-45	6.7
Charlston Comorbidity Index		2.7	0-10	3
ASA Score		2.9	2-4	0.6
<i>SD, Standard Deviation; BMI, Body Mass Index; ASA, American Society of Anesthesiologists</i>				

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Baseline Characteristics

Table 2. Baseline characteristics of stones treated with
Mini-PCNL with Thulium Laser Lithotripsy

Stone Characteristic	# (%)	Mean	Range	SD
Unilateral	14 (93)			
Single Primary Stone	8 (53)			
Total Stone Volume (mm ³)		4,744	524-18,000	4,970
Stone Density (HU)		1,210	510-1,650	294

SD, Standard Deviation; HU, Hounsfield Units

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Outcomes

Table 3. Operative Outcomes in
Mini-PCNL with Thulium Laser Lithotripsy

Outcome	# (%)	Mean	Range	SD
Laser time (minutes)	9 (60)	13.1	0.9-28	9.8
Laser time (seconds)/Stone vol (cm3)		196.5	46-588	170
Operative time (minutes)		87	56-116	17.4
Postoperative Stent Rate				
Postoperative Stent Days		9	1-23	9
Decrease in Creatinine (mg/dL)		0.1	(-0.9)-0.2	0.3
Decrease in Hemoglobin (g/dL)		1.8	0.3-3.5	0.1

SD, Standard Deviation;

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Outcomes

- Length of stay was 1 night for all
- No intraoperative complications
- 1 patient presented on 7th day for gross hematuria requiring bladder irrigation
- No blood transfusions in this series

Table 3. Operative Outcomes in Mini-PCNL with Thulium Laser Lithotripsy				
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Conclusions

- **Efficient**
 - Limited treatment times even in large dense renal calculi
- **Effective**
 - Calculi completely cleared through Mini-PCNL sheath
- **Safe**
 - No intraoperative complications in current series
- **Synergy between Supine Mini-PCNL and Thulium Laser**
 - Gravity and Venturi effect potentiate passive clearance of dust/fragments

Thank You



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