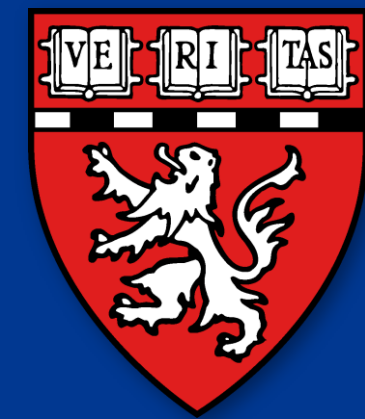




# Knot My Best Epidural

## Multiplanar reconstruction and 3D rendering of a retained epidural catheter tip



Stratton Dangerfield MD, Michael Furdyna MD, Michaela Farber MD MS, Ayumi Maeda MD PhD  
Brigham and Women's Hospital | Harvard Medical School | Boston USA

### Background

- Retained epidural catheters are a rare complication with a suspected incidence of 0.002%.<sup>1</sup>
- Risk factors:<sup>2</sup>
  - Excessive catheter threading
  - Threading against resistance
  - Catheters with a damaged tip
  - Excessive force during removal
- We present a case of a retained epidural catheter that 3D CT reconstruction revealed to be knotted.

<sup>1</sup> Gompels 2022 , <sup>2</sup> Reena 2017

### Case Presentation

- G2P1 term induction for gestational hypertension. BMI 38.4.
- No history of back pathology or surgery.
- During her labor, she required three epidural catheters:

Catheter #1 Failed due to sacral sparing – removed.

Catheter #2 Placed from L3/4 (US guided) in R lateral position.

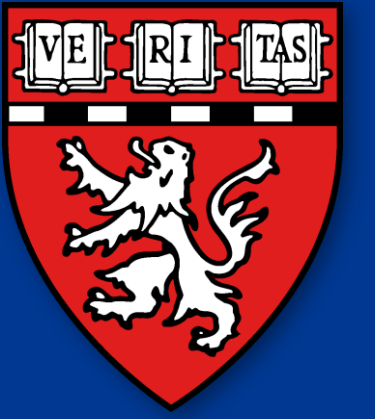
- One attempt, one redirection to walk off R lamina.
- LOR at 7.5cm; confirmed with +DPE (25G).
- No resistance with catheter advancement.
- Worked initially, then pain recurred four hours later.
- Catheter removal attempts unsuccessful → left in situ.

Catheter #3 Placed from L4/5. Uncomplicated. Provided good pain relief for her primary Cesarean delivery in the setting of non-reassuring fetal heart tracing.





# Knotted Catheter

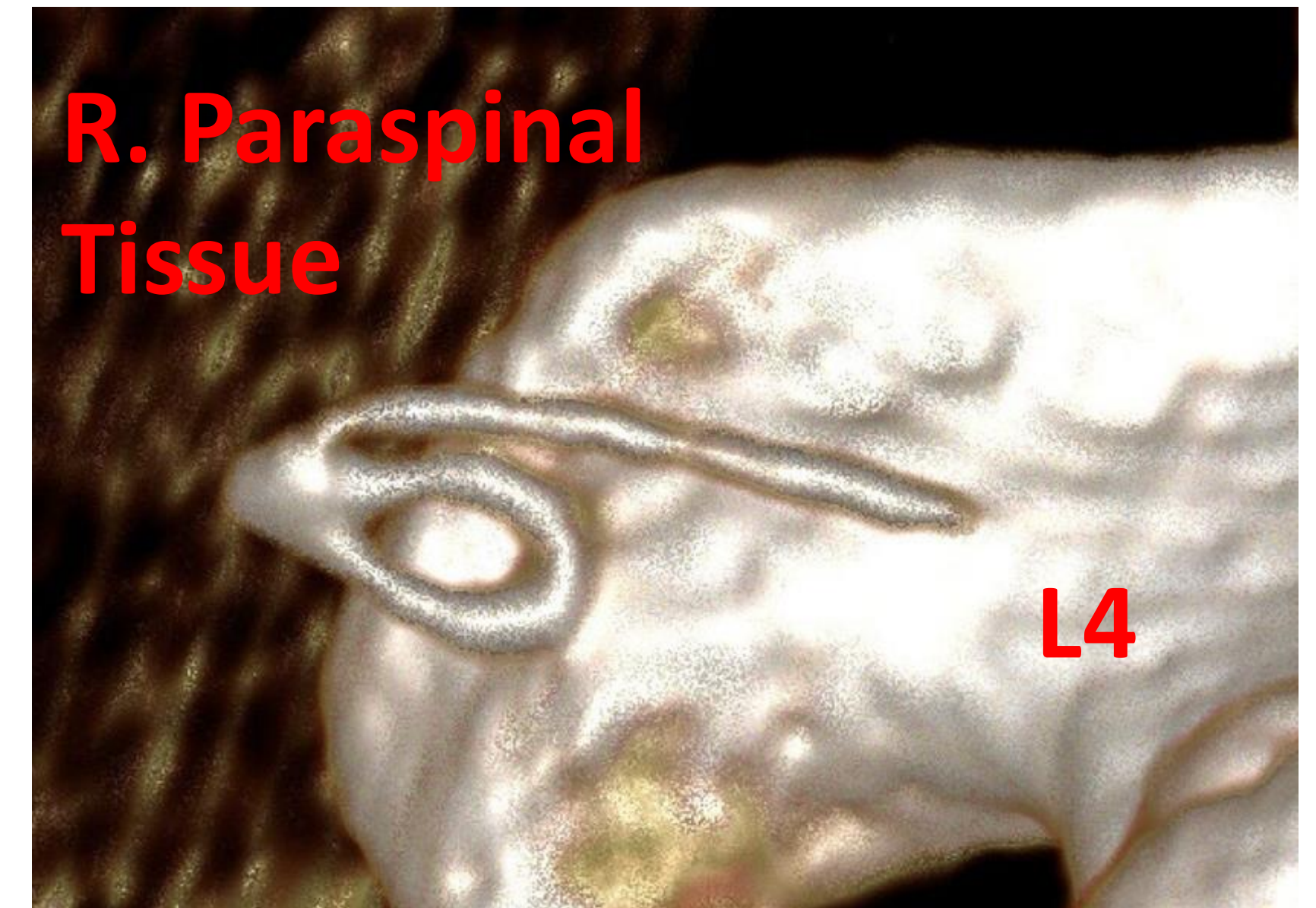


## Postpartum Course

- Unable to remove the second catheter despite multiple attempts (different positions, tongue depressor, Allis clamp)
- Retained epidural taped under tension and left for 24 hours
- Retained catheter snapped when unwound from tension
- CT imaging revealed knotted catheter in right paraspinal tissue
- Neurosurgery consulted and recommended no intervention
- Patient initially desired surgical removal; however, decided to keep it in situ

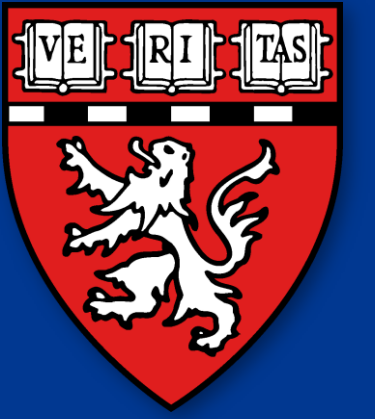


Unwound catheter in situ

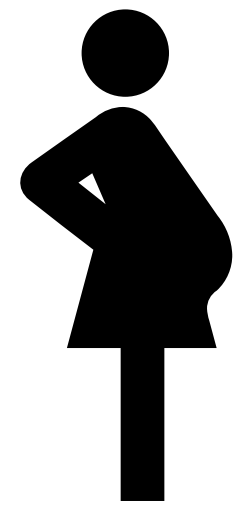


Enhanced image, generated using multiplanar reconstruction and 3D rendering in Visage 7, showing knotted catheter in right paraspinal tissue





# Teaching Points



## Risk Factors: <sup>1, 2</sup>

- Excessive threading in space
- Threading against resistance
- Excessive force with catheter removal



## Indications for Removal:

- Patient request, neurologic symptoms, signs of infection
- Retained foreign body is a common cause of closed claim against anesthesiologists <sup>3</sup>



## Mechanism of Knotting:

- Our patient had no obvious risk factors for a retained catheter.
- Our best theory: **laterally-placed catheter pulled in seated position** <sup>4</sup>