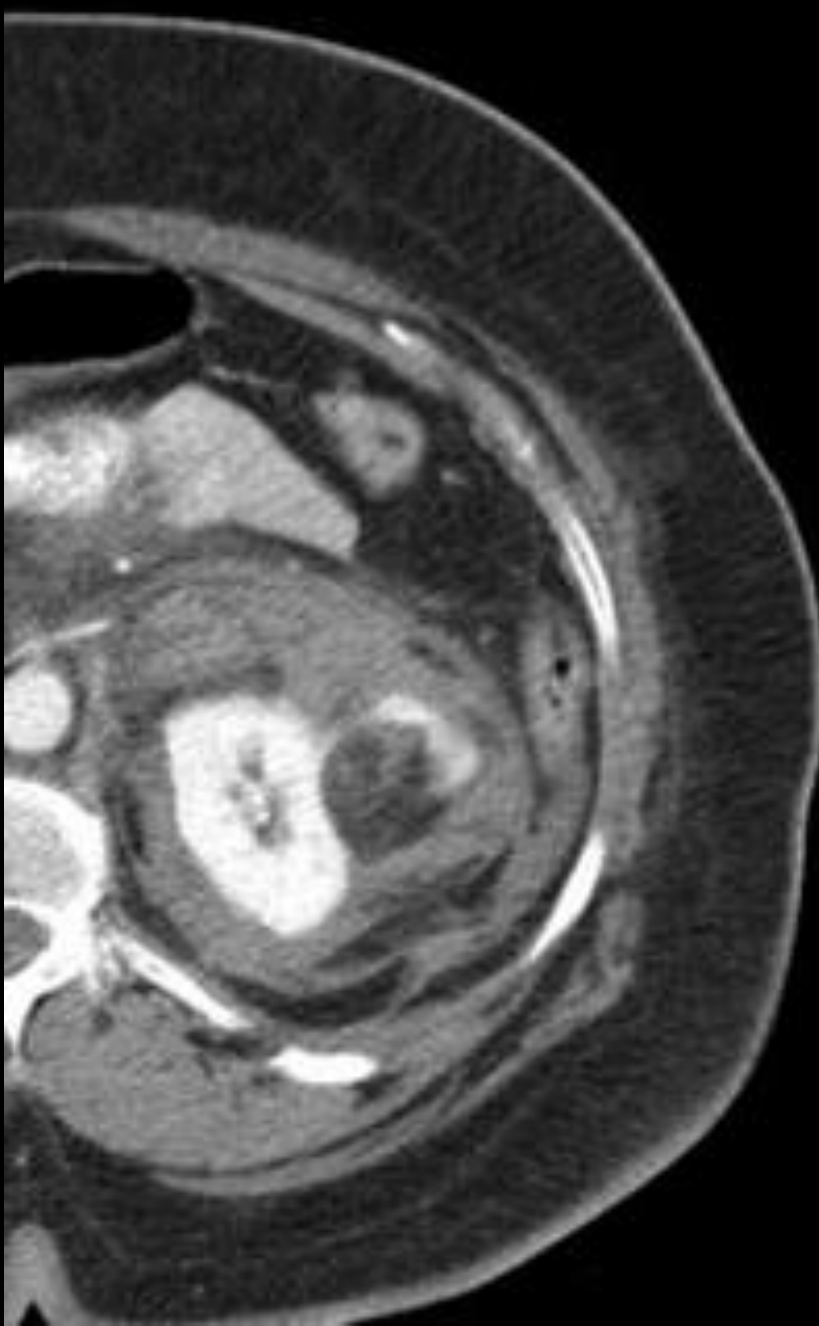




# Patterns of Abdominal Haemorrhage



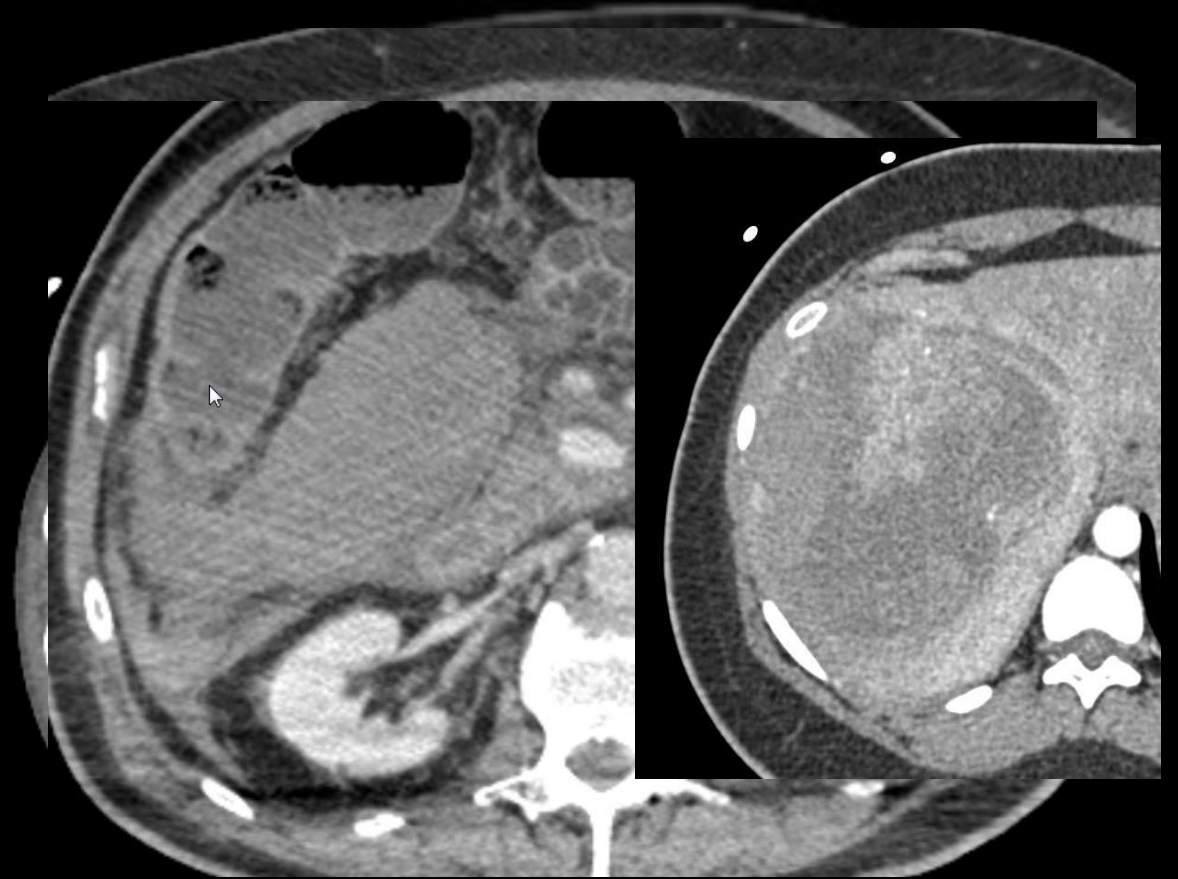
**Fausto Labruto**  
Associate Professor  
Director of Emergency Radiology

# Contents

- Causes of abdominal haemorrhage
- Non-haemorrhagic causes of fluid in the abdomen
- How to identify blood in the abdomen
  - Density
  - Haematocrit effect
  - Sentinel clot sign
  - Extravasation
- Radiological signs of haemorrhagic shock
- Peritoneal spaces
  - Supramesocolic
  - Inframesocolic
- Retroperitoneal spaces
- The concept of interfascial spread

## Causes of non-traumatic abdominal haemorrhage

- Spontaneous bleedings
- Bleedings from masses
- Bleedings from vascular abnormalities
- Gynaecological bleedings



# Non-haemorrhagic causes of fluid in the abdomen

- Physiologic
- Recent surgery
- Perforation
- Exudate or transudate
- Leakage: urine, bile, lymph, etc.
- Peritoneal dialysis or shunts

# Blood: density

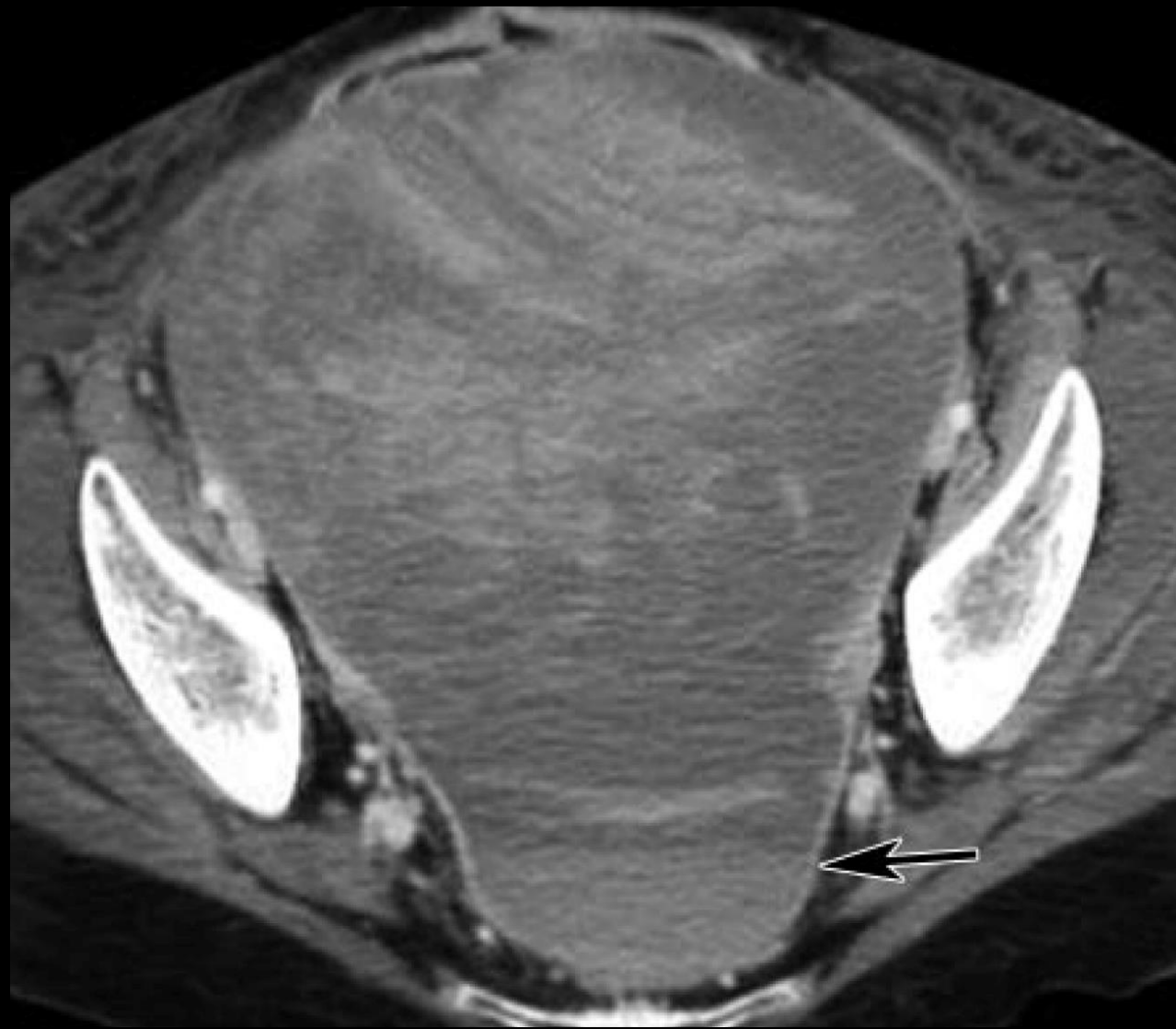
**30 - 45 HU:** Non-clotted, fresh, extravascular blood

**45 - 70 HU:** Clotted blood

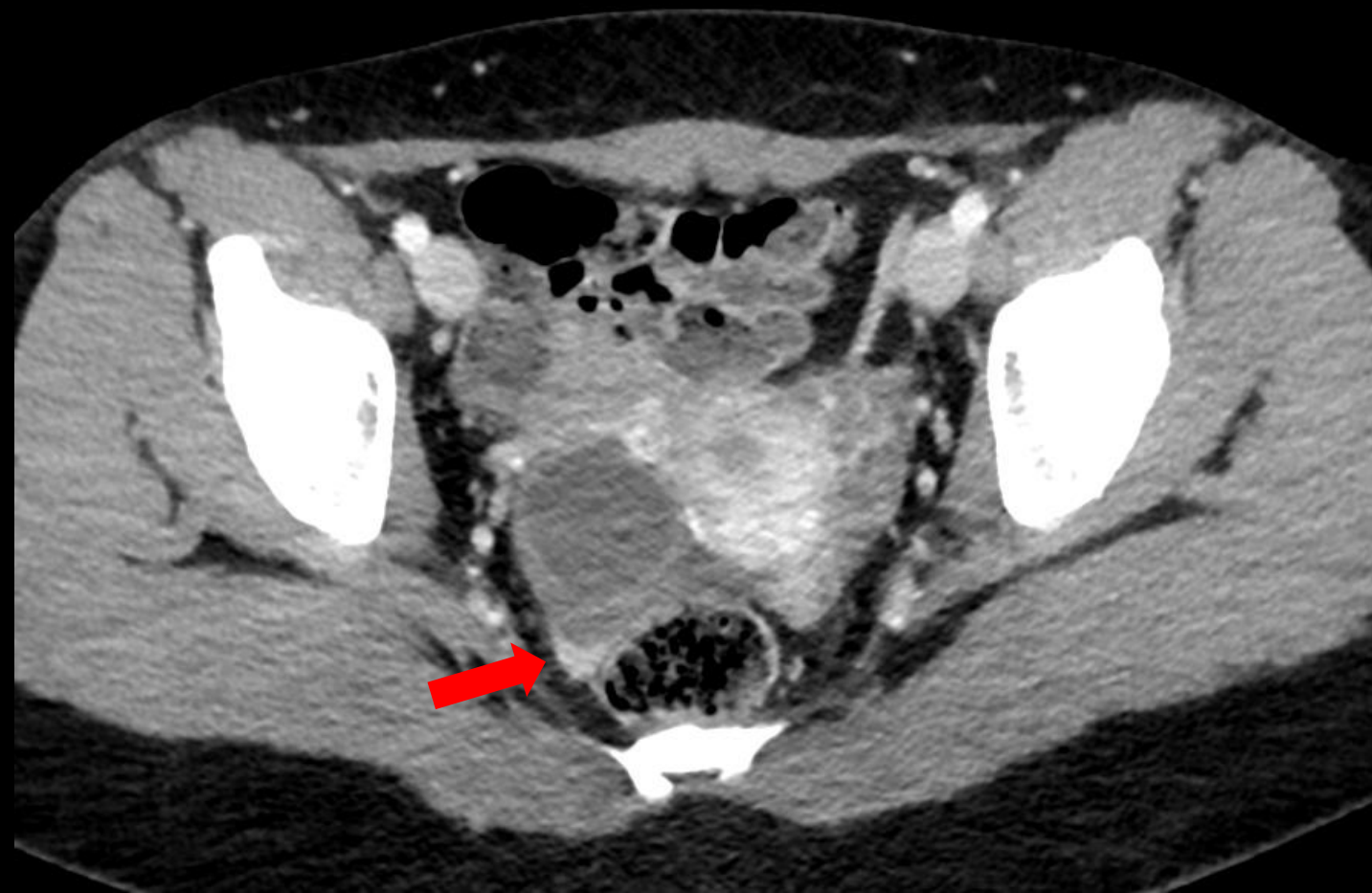
**>70 HU:** Usually secondary to extravasated contrast agent

**< 30 HU:** May occur with low haematocrit levels or in a bleeding >48 hours old

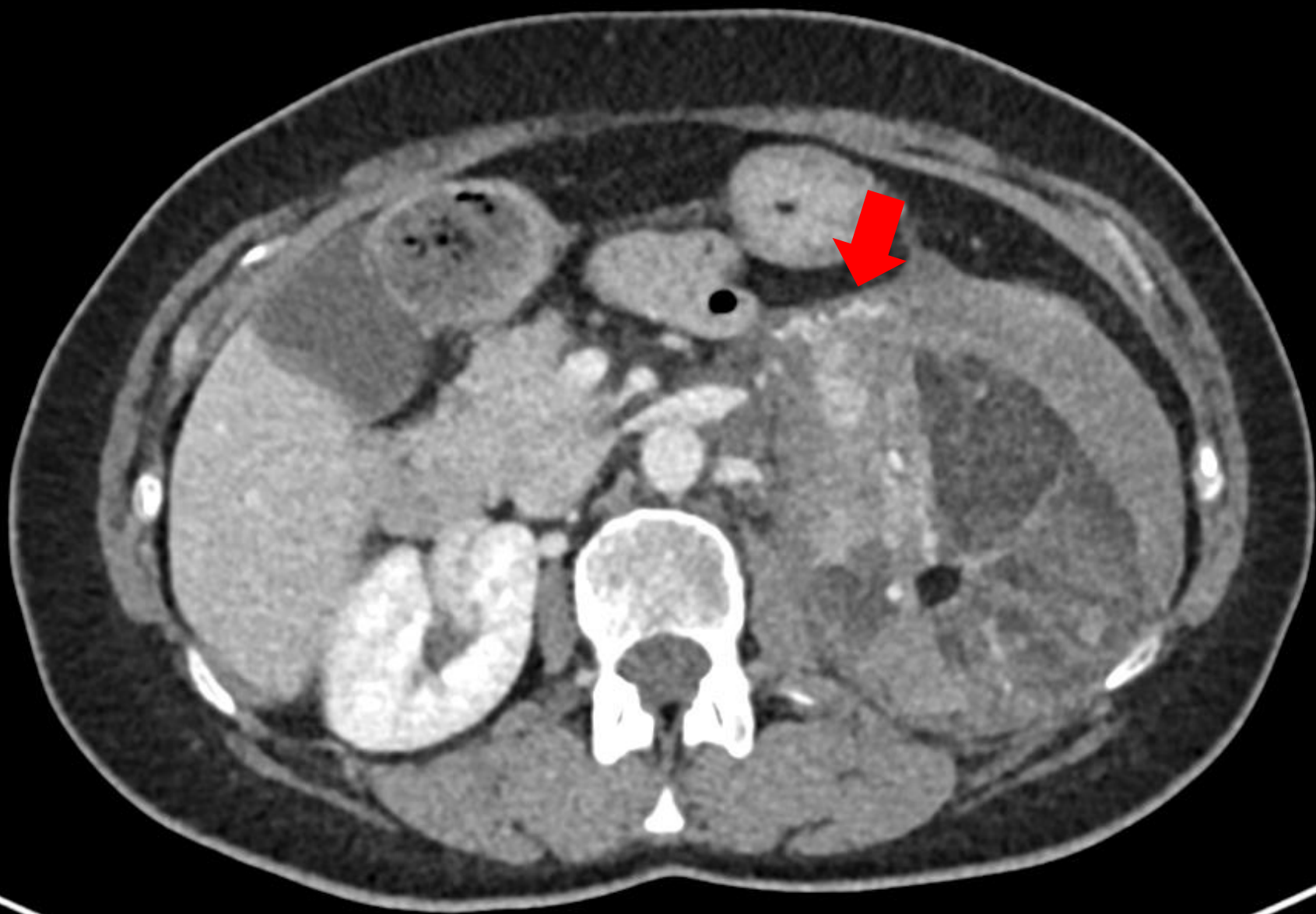
# “Haematocrit effect”



# “Sentinel clot” sign

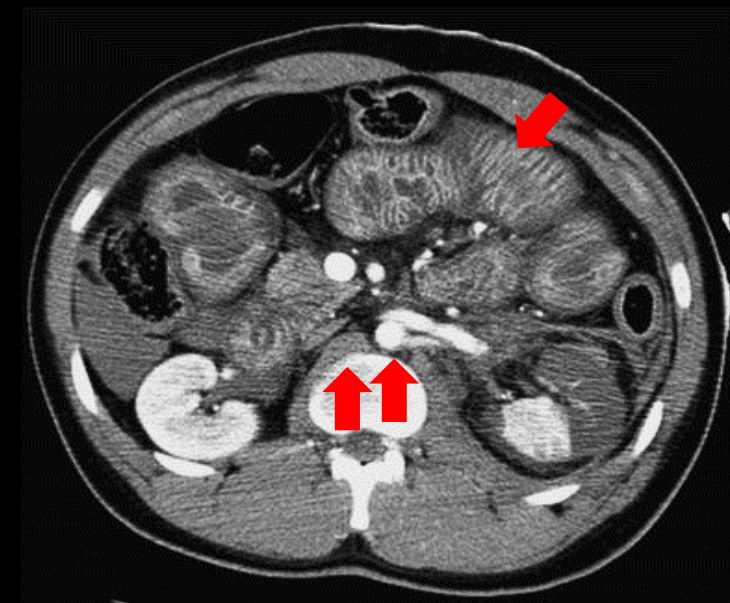
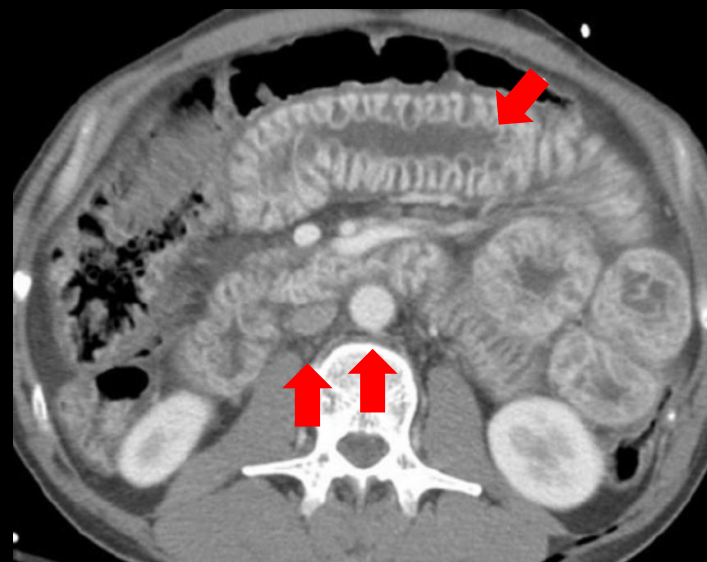
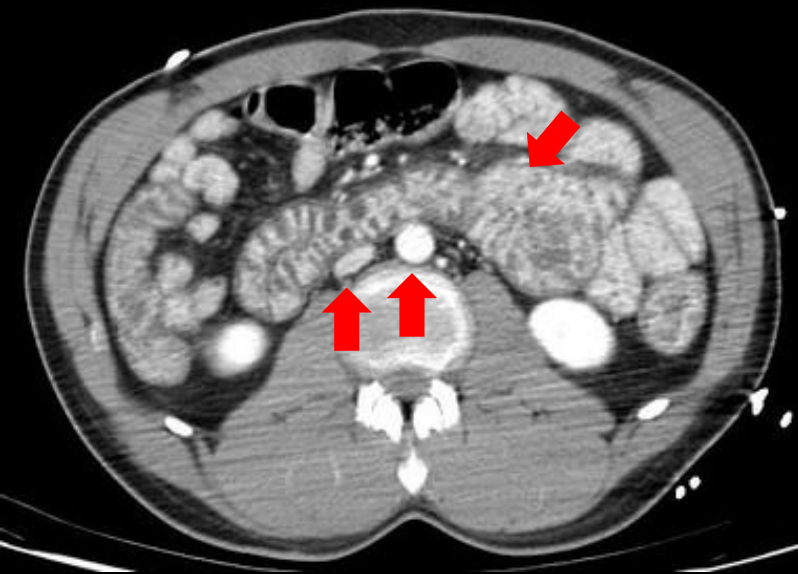


# Extravasation of contrast agent





# Signs of haemorrhagic shock

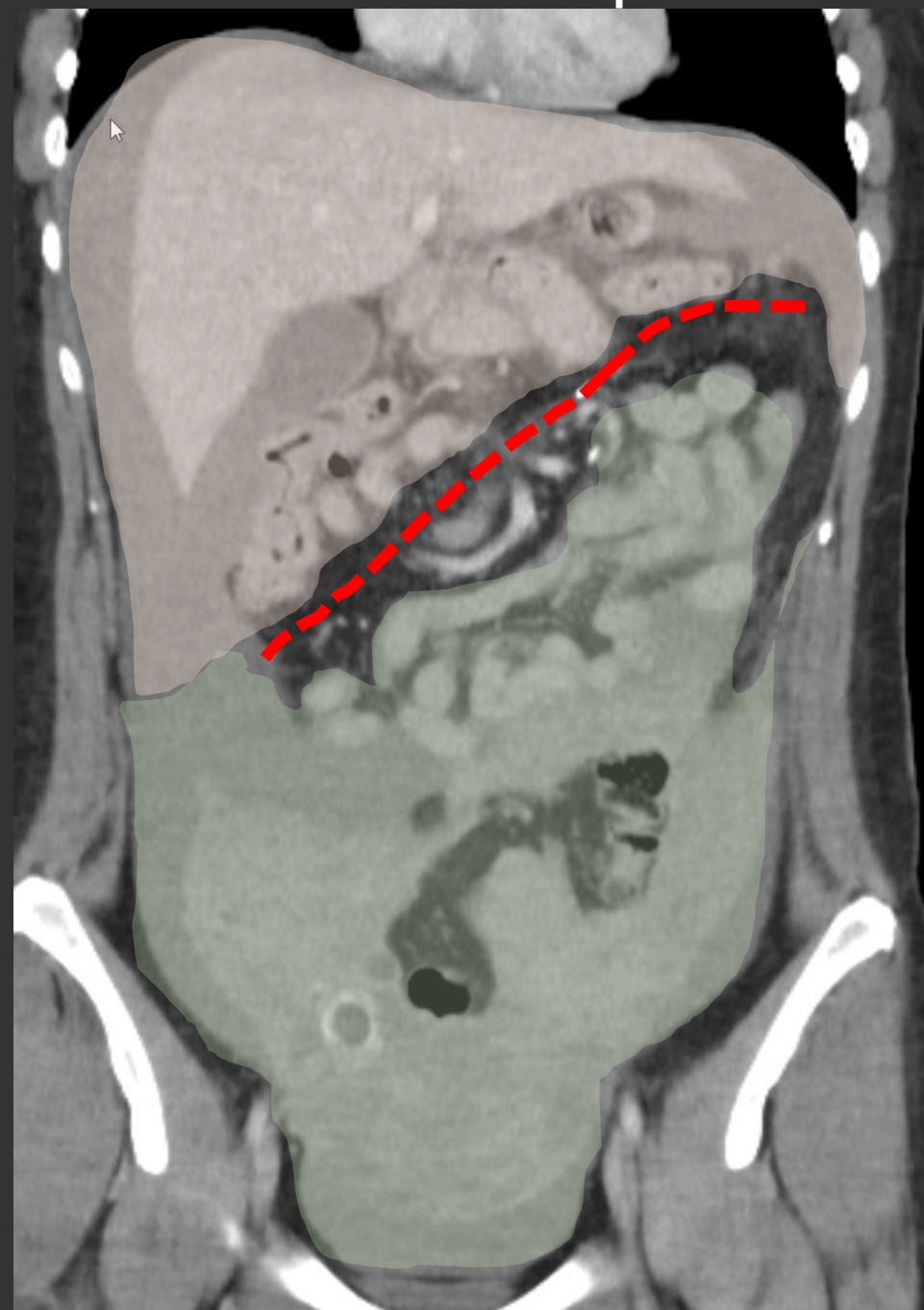


# Signs of haemorrhagic shock



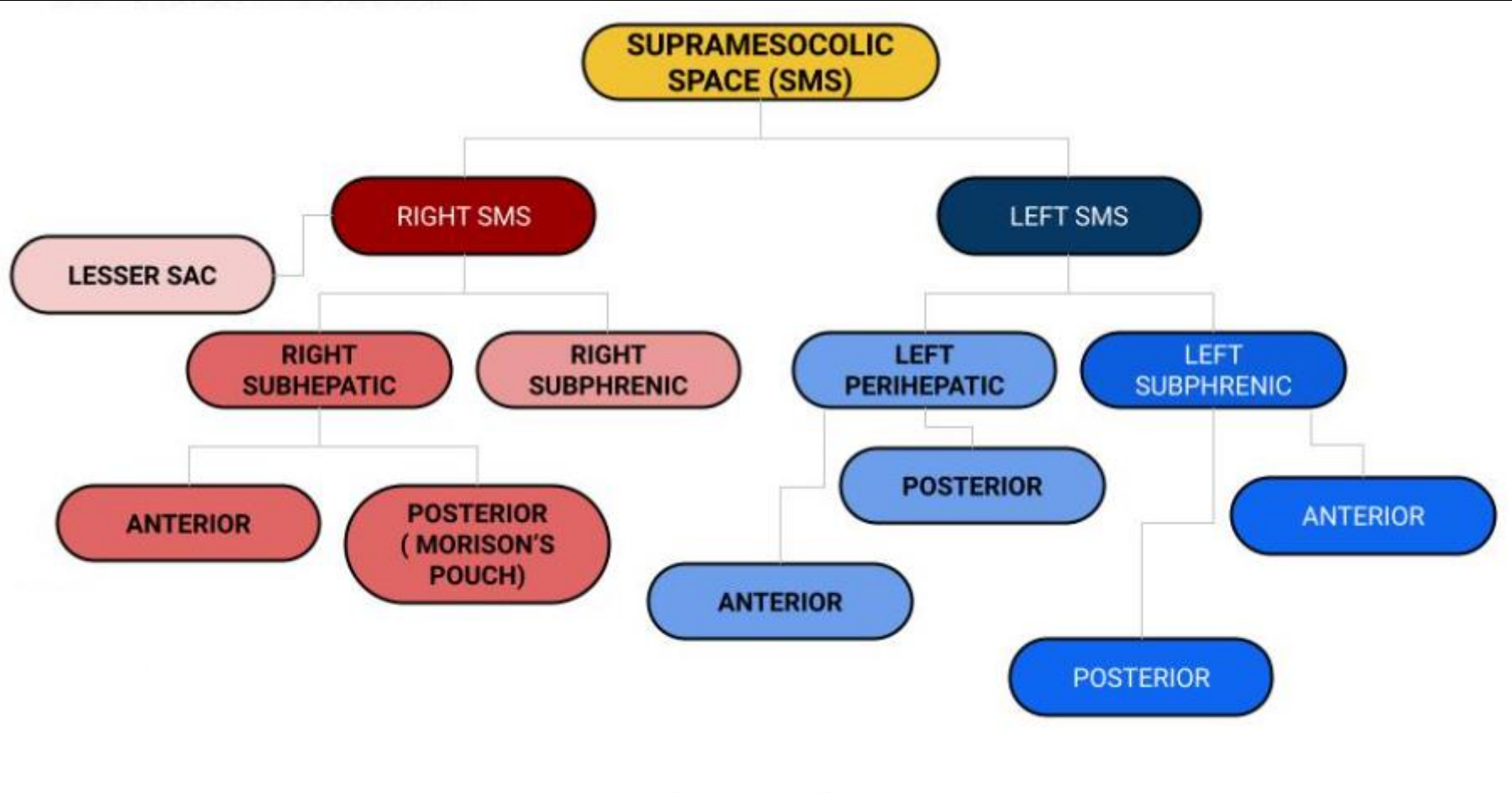
# Peritoneal spaces

Supramesocolic spaces



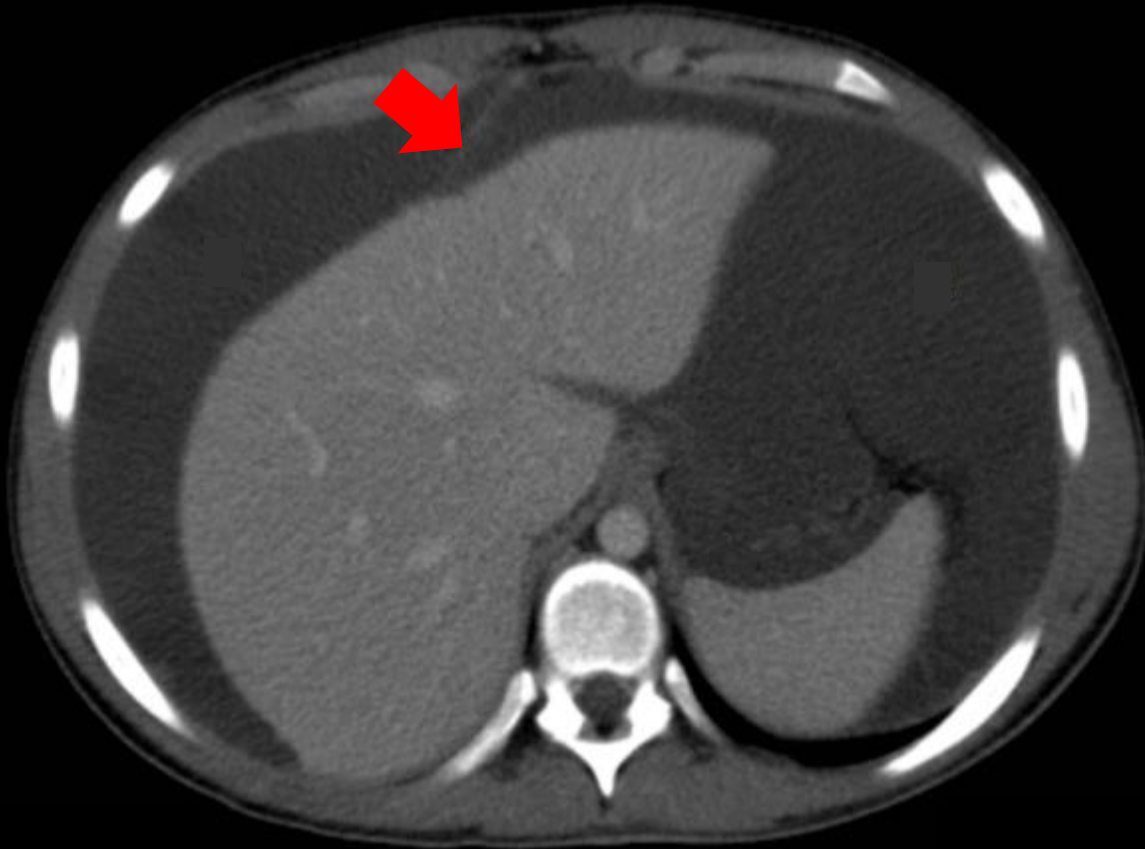
Inframesocolic spaces

# Supramesocolic space



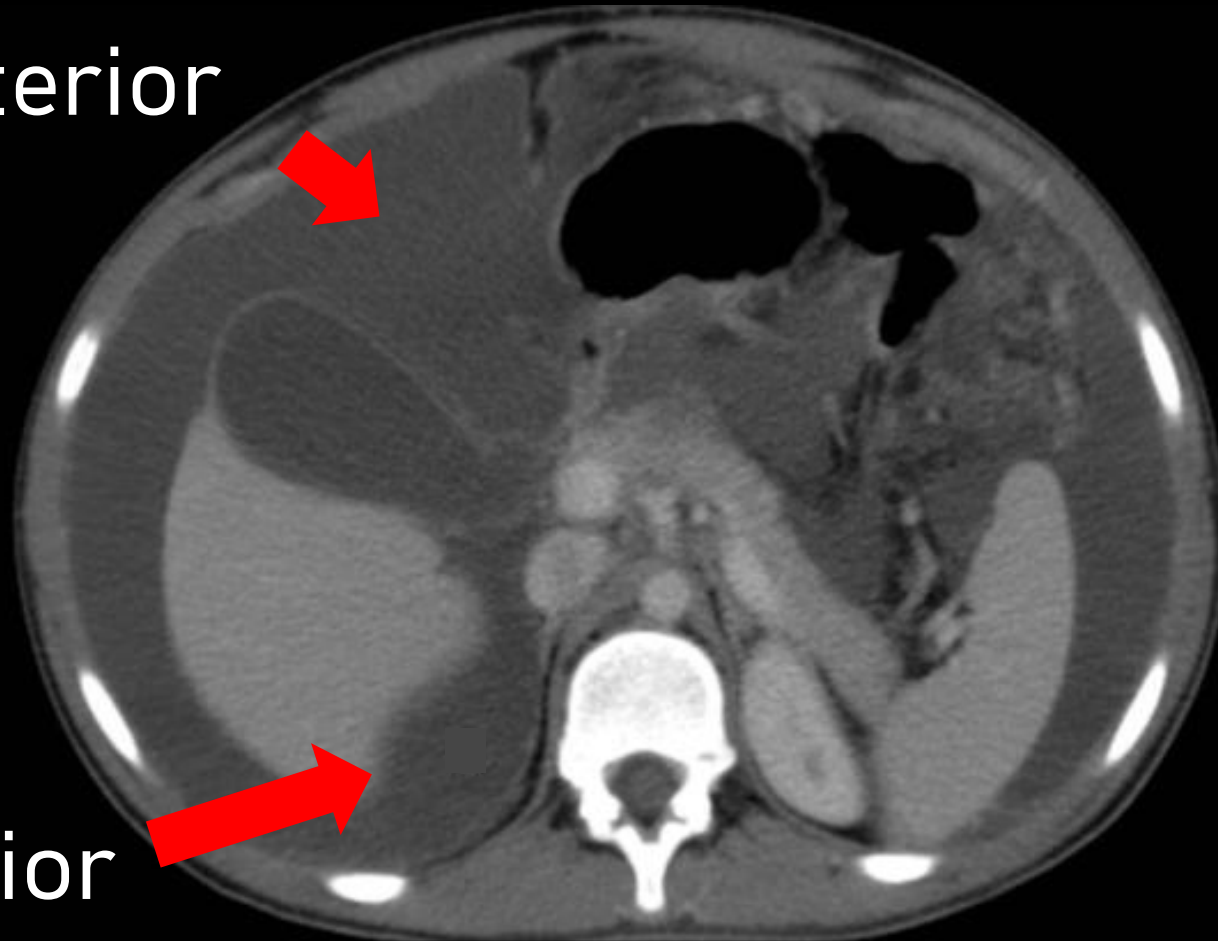
# Falciform Ligament

Boundary of the right subphrenic space  
Prevents spread of the haematoma to the left



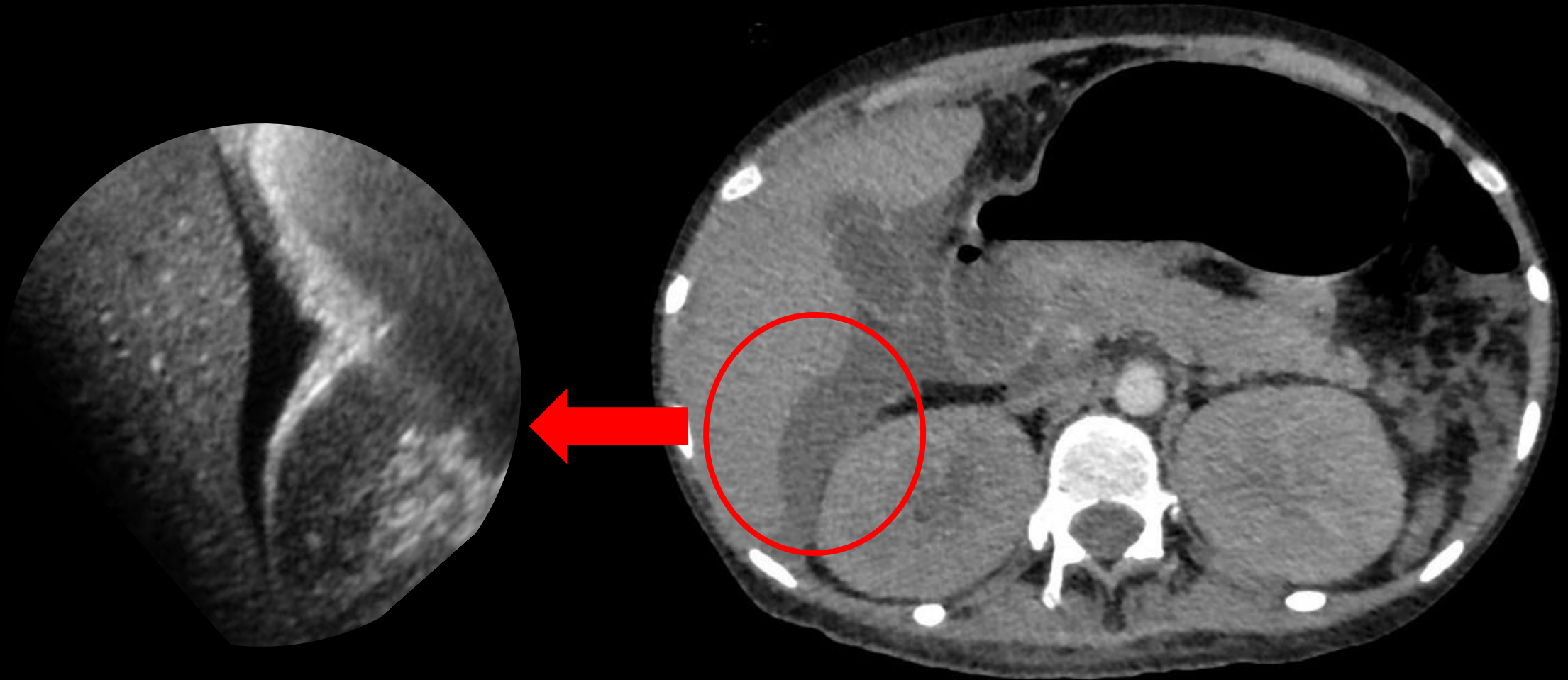
# Right subhepatic space

Anterior



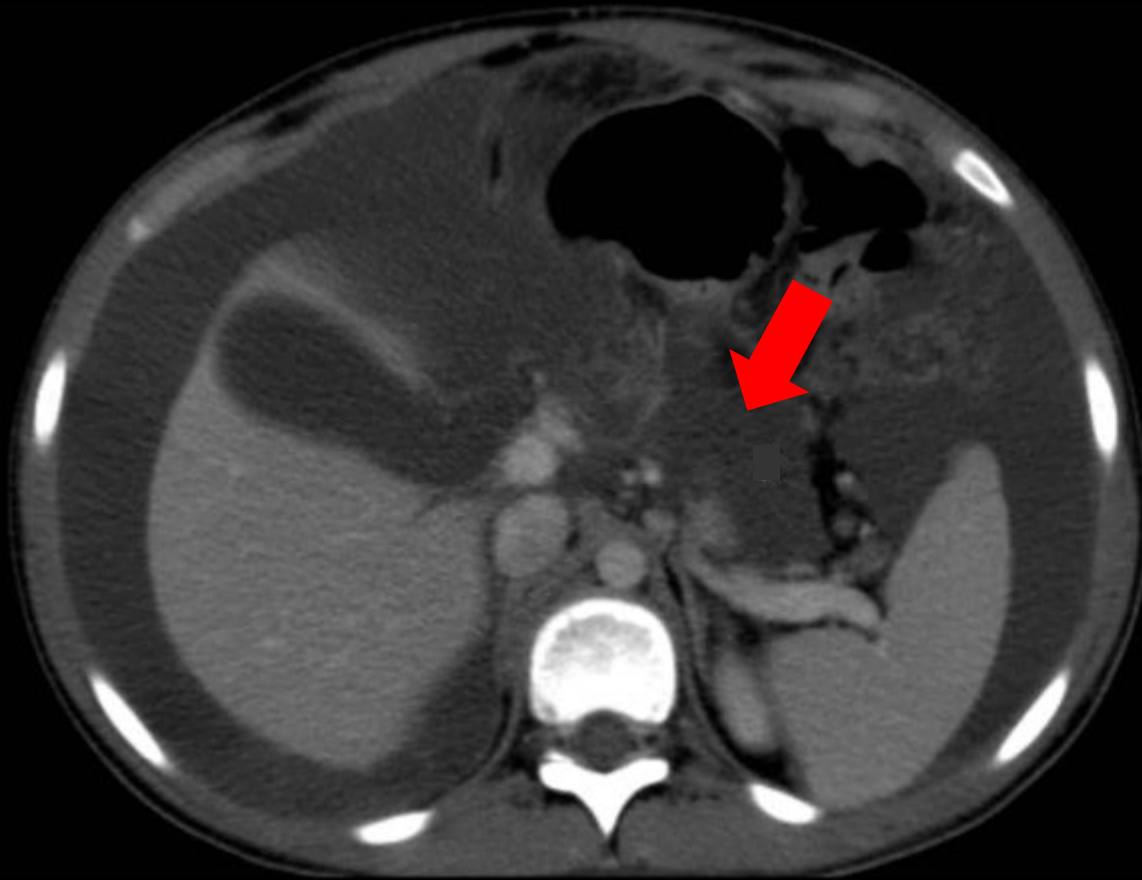
Posterior

Posterior right subhepatic space



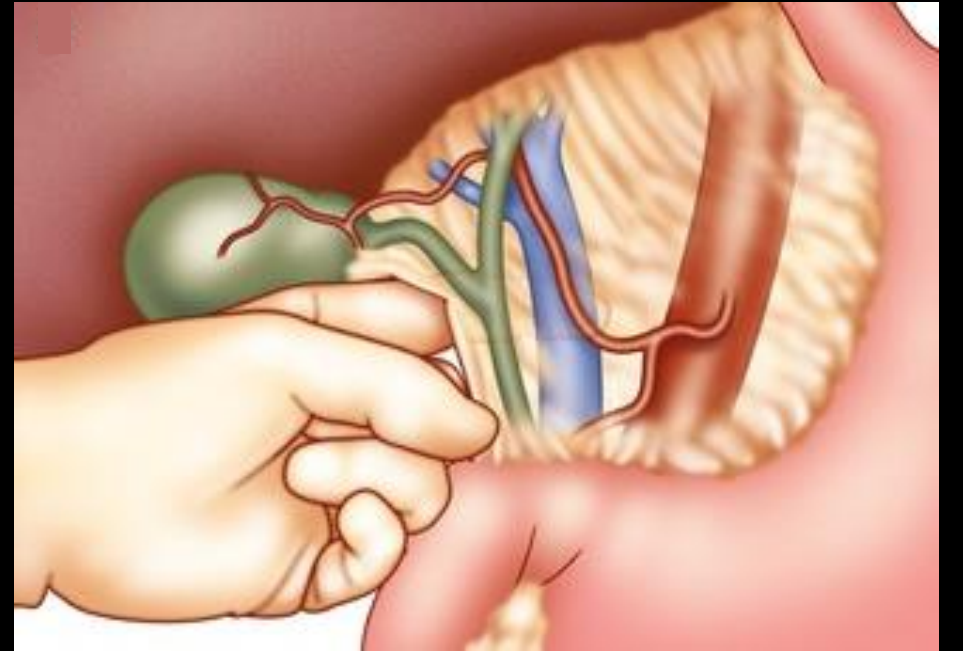
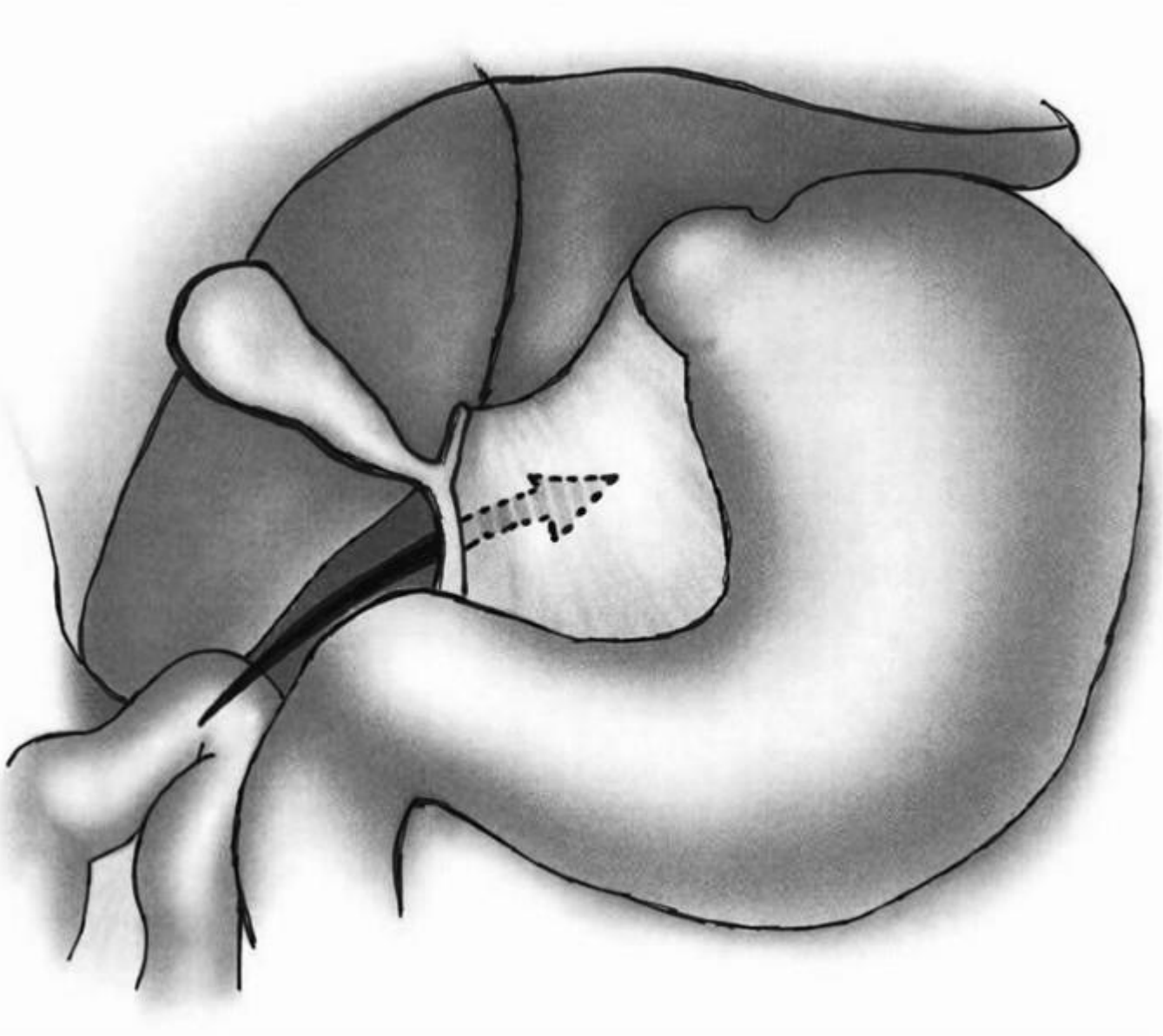
Morrison's Pouch

# Lesser Sac

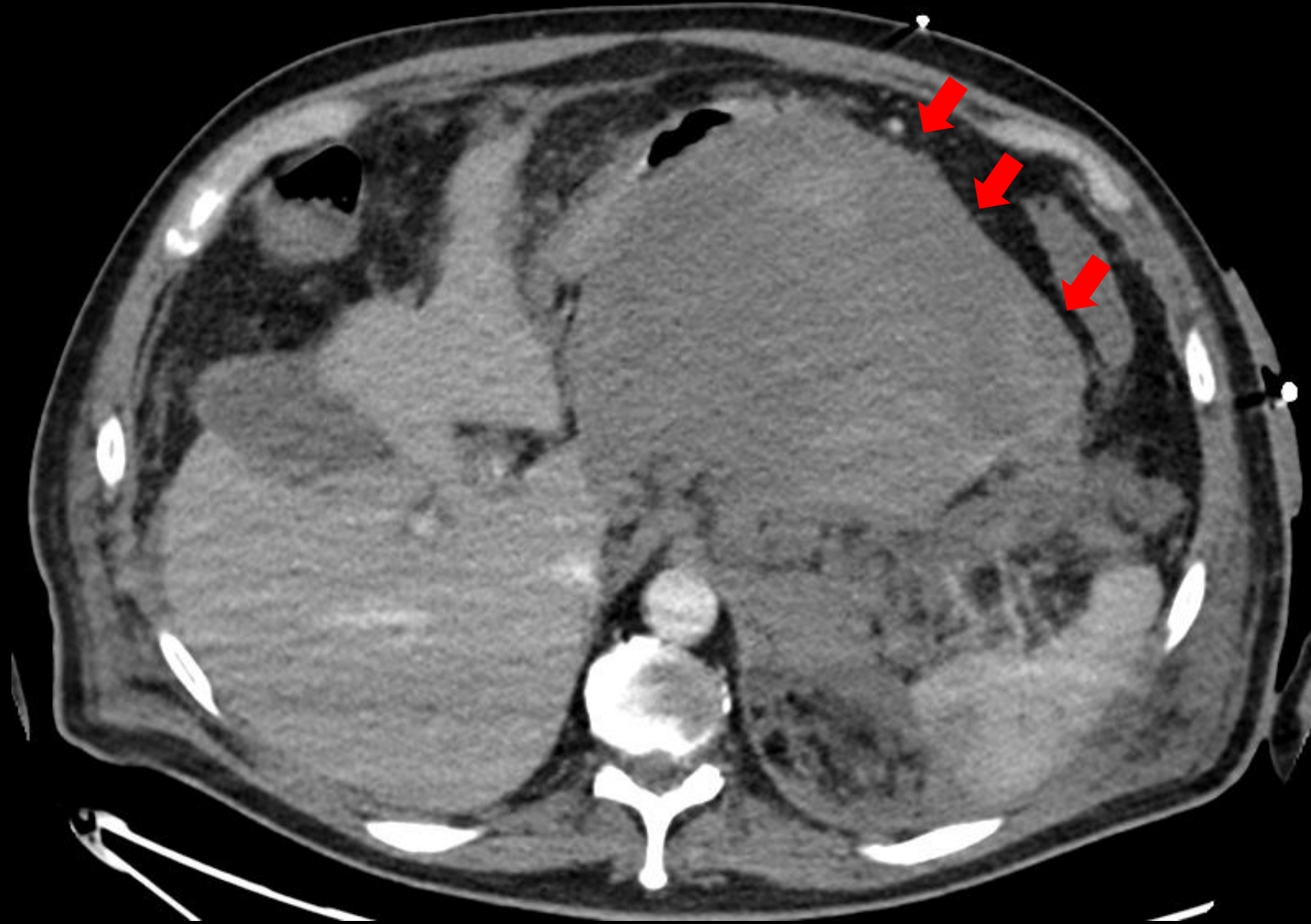




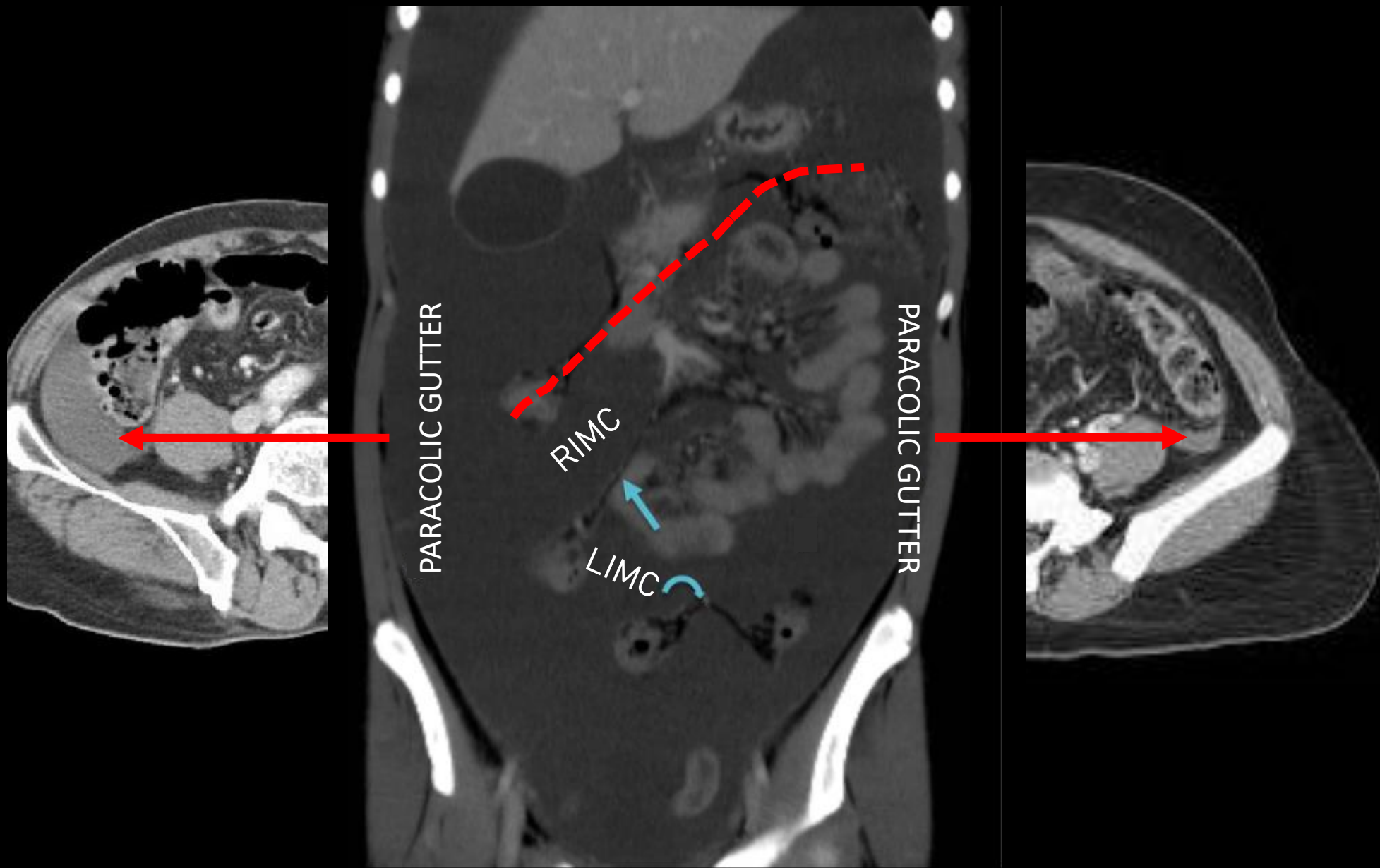
# Lesser Sac

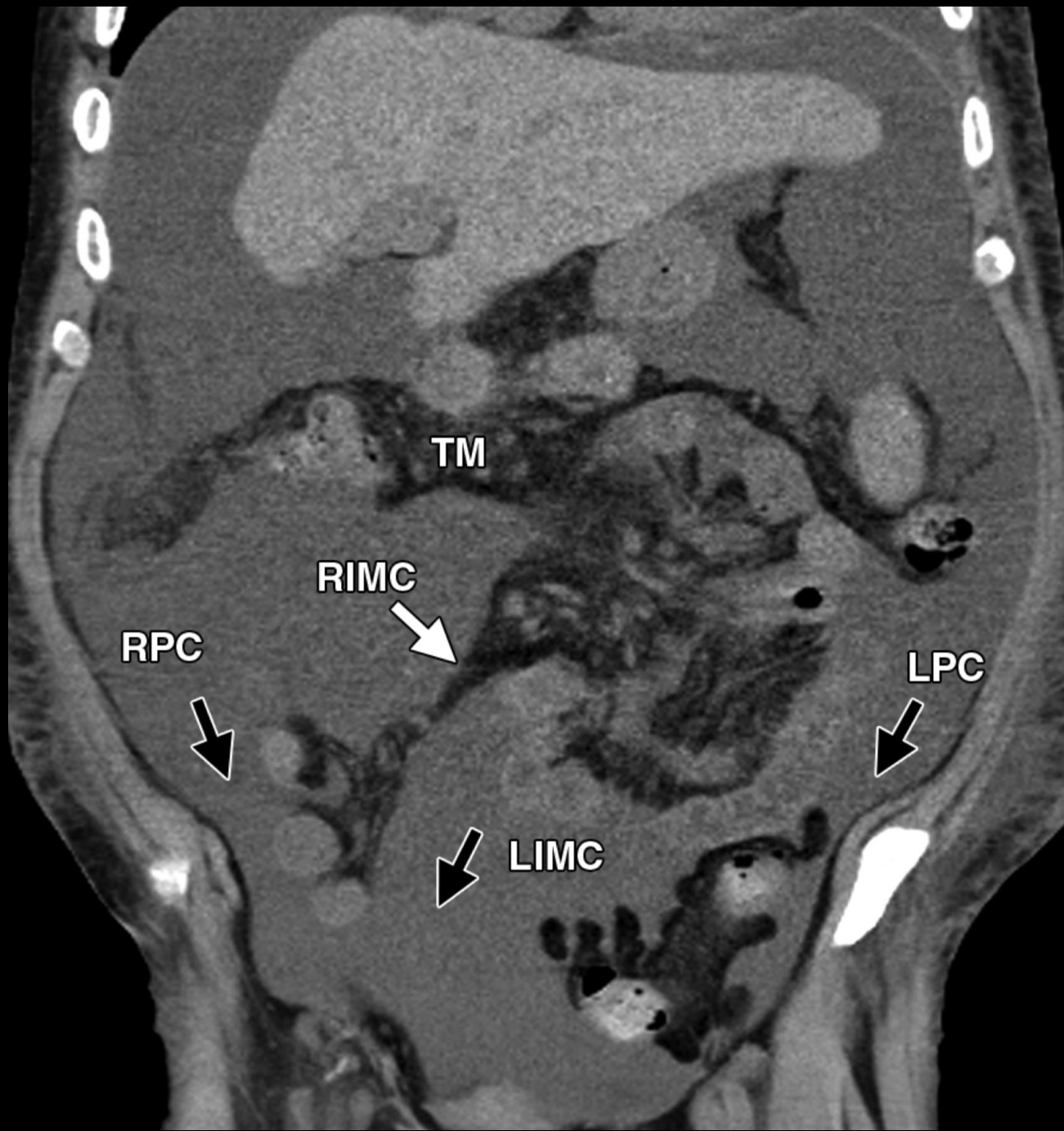


# Lesser Sac



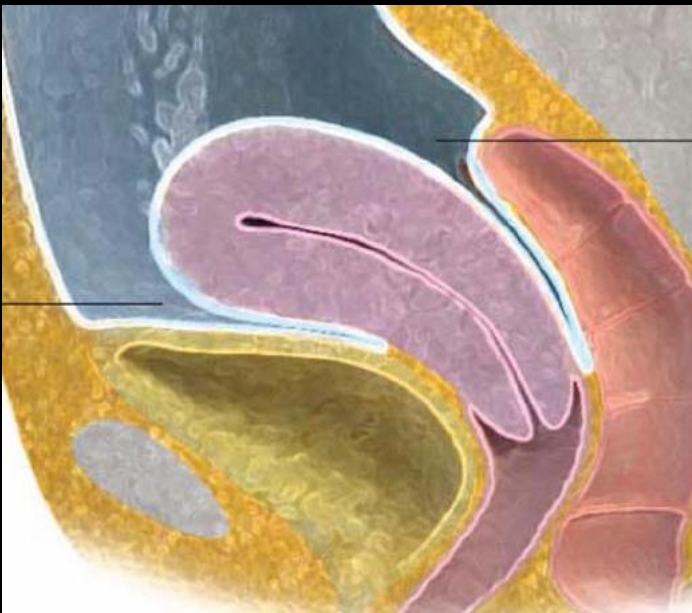
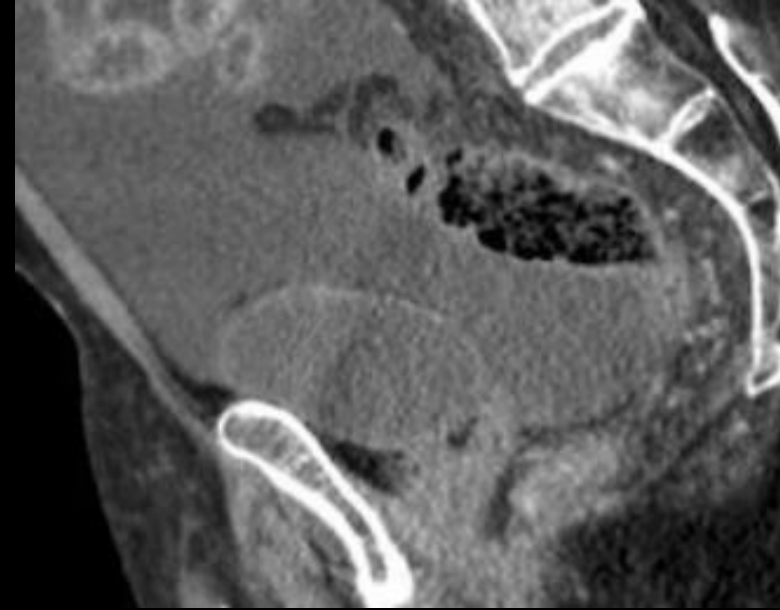
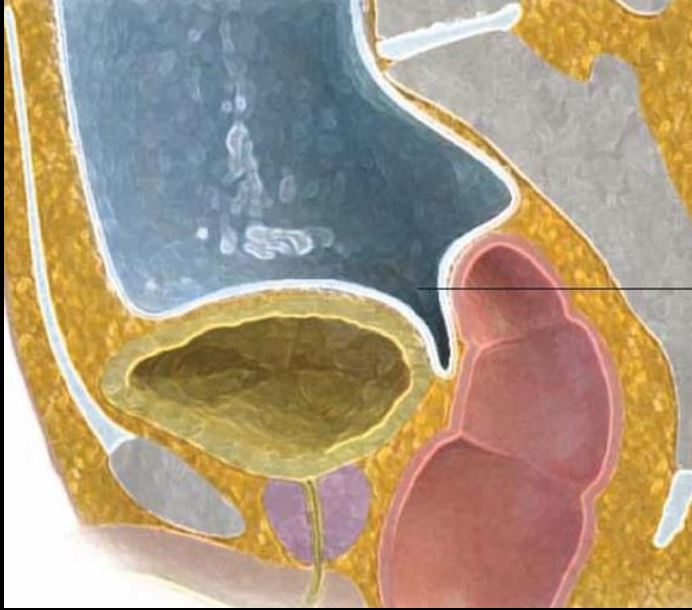
# Inframesocolic spaces



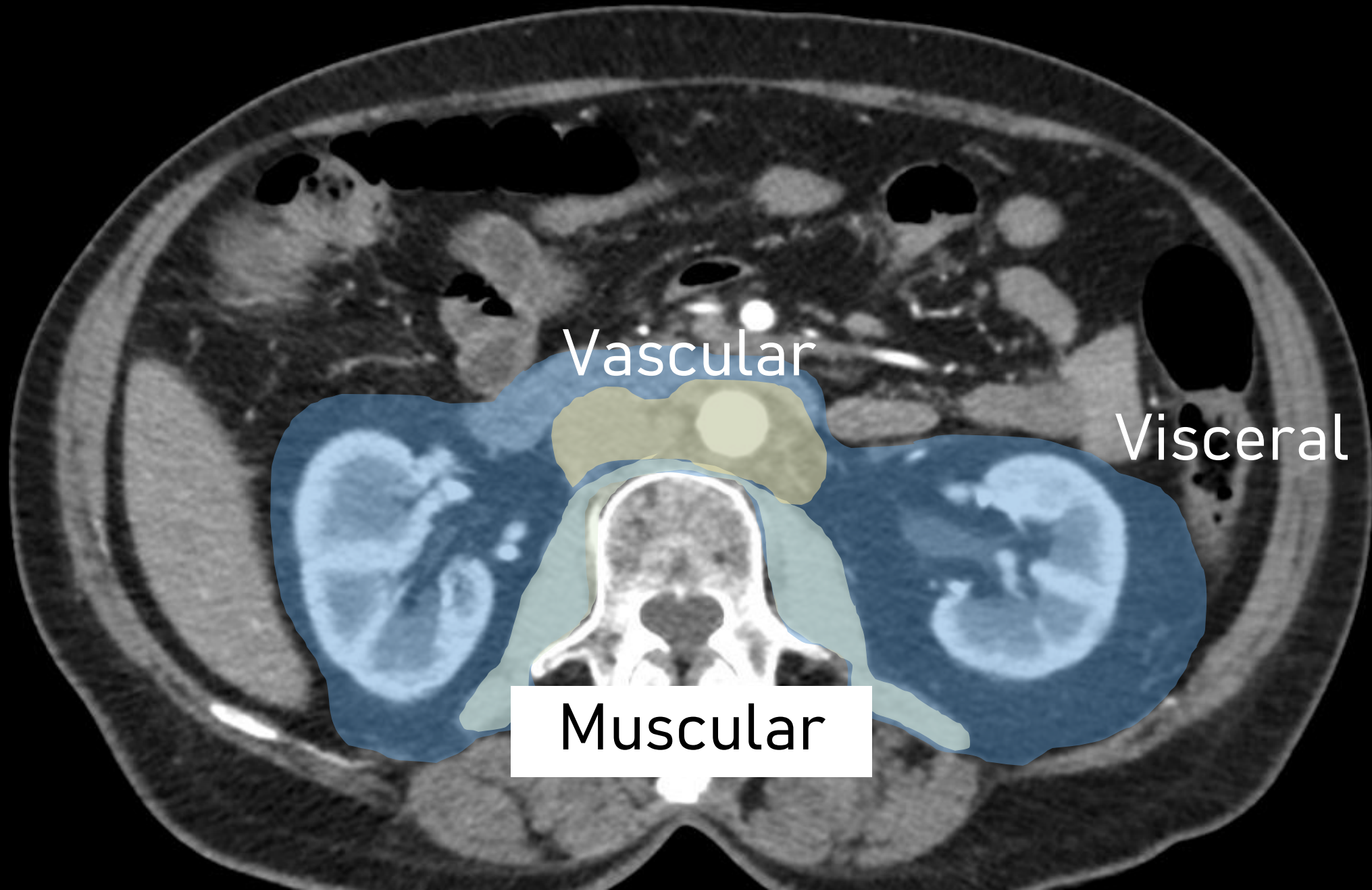




# Douglas' Pouch



# Retroperitoneal Spaces

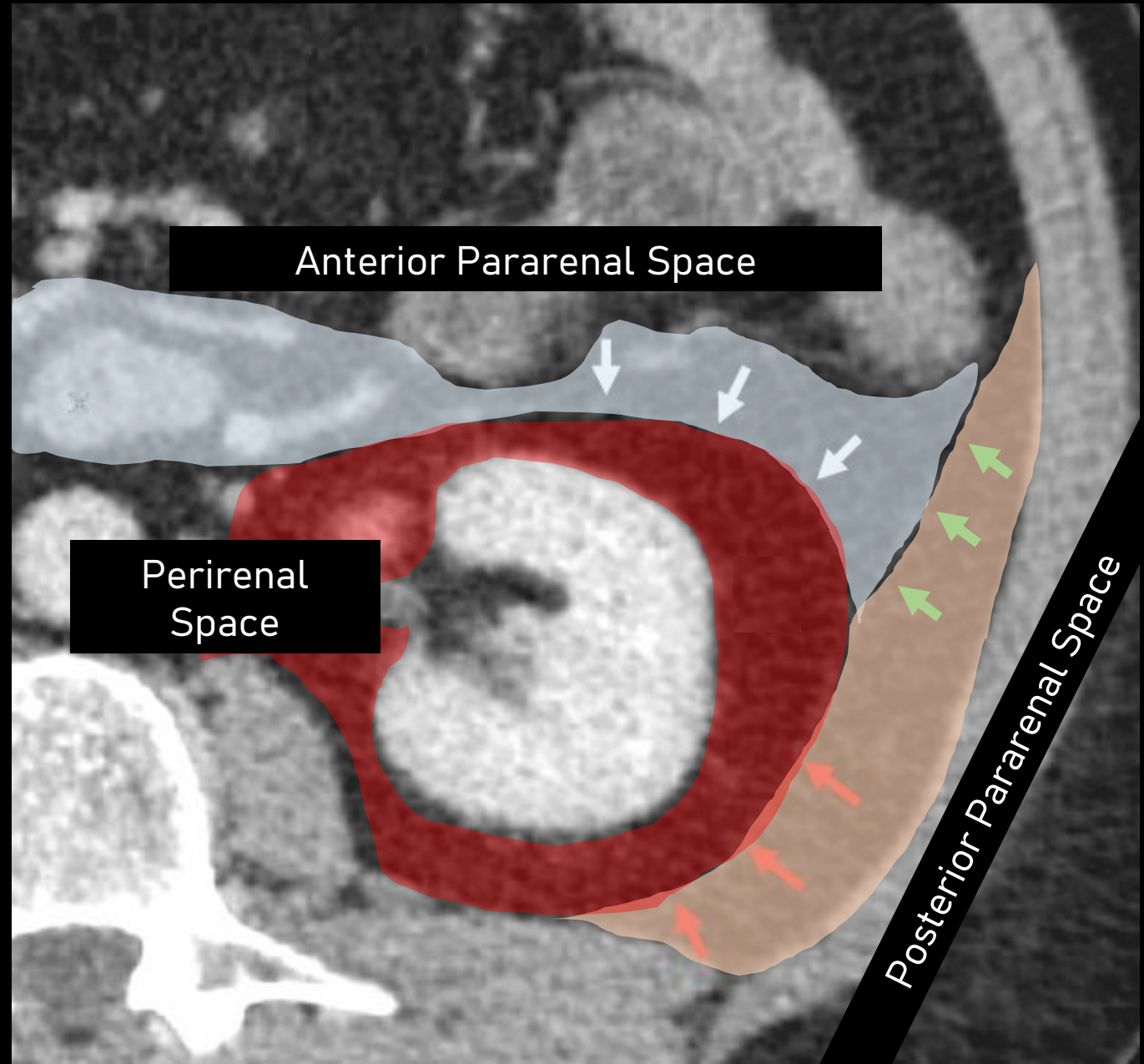


Vascular

Visceral

Muscular

The Gerota and Zuckerkandel fascias fuse laterally, creating the latero-conal fascia

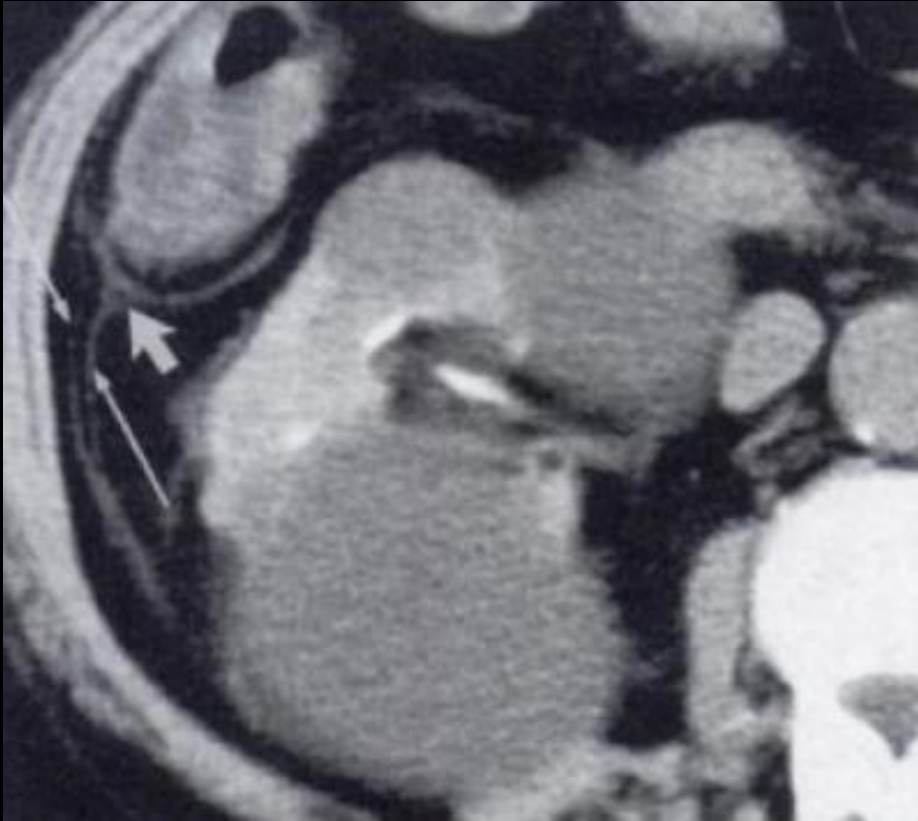
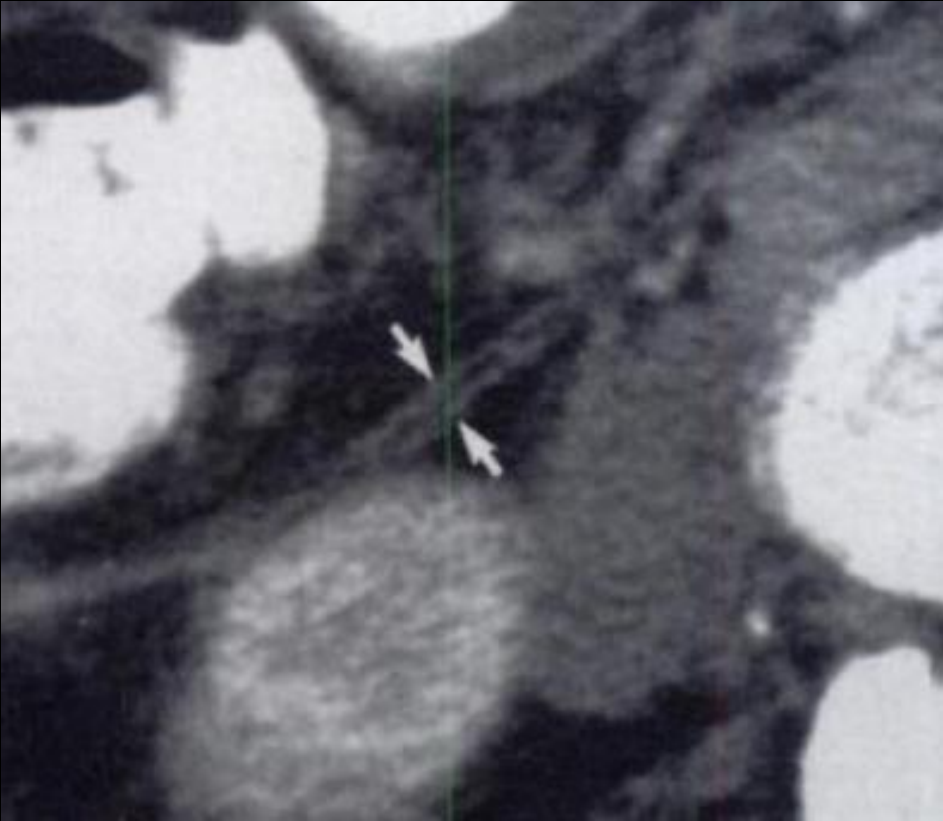




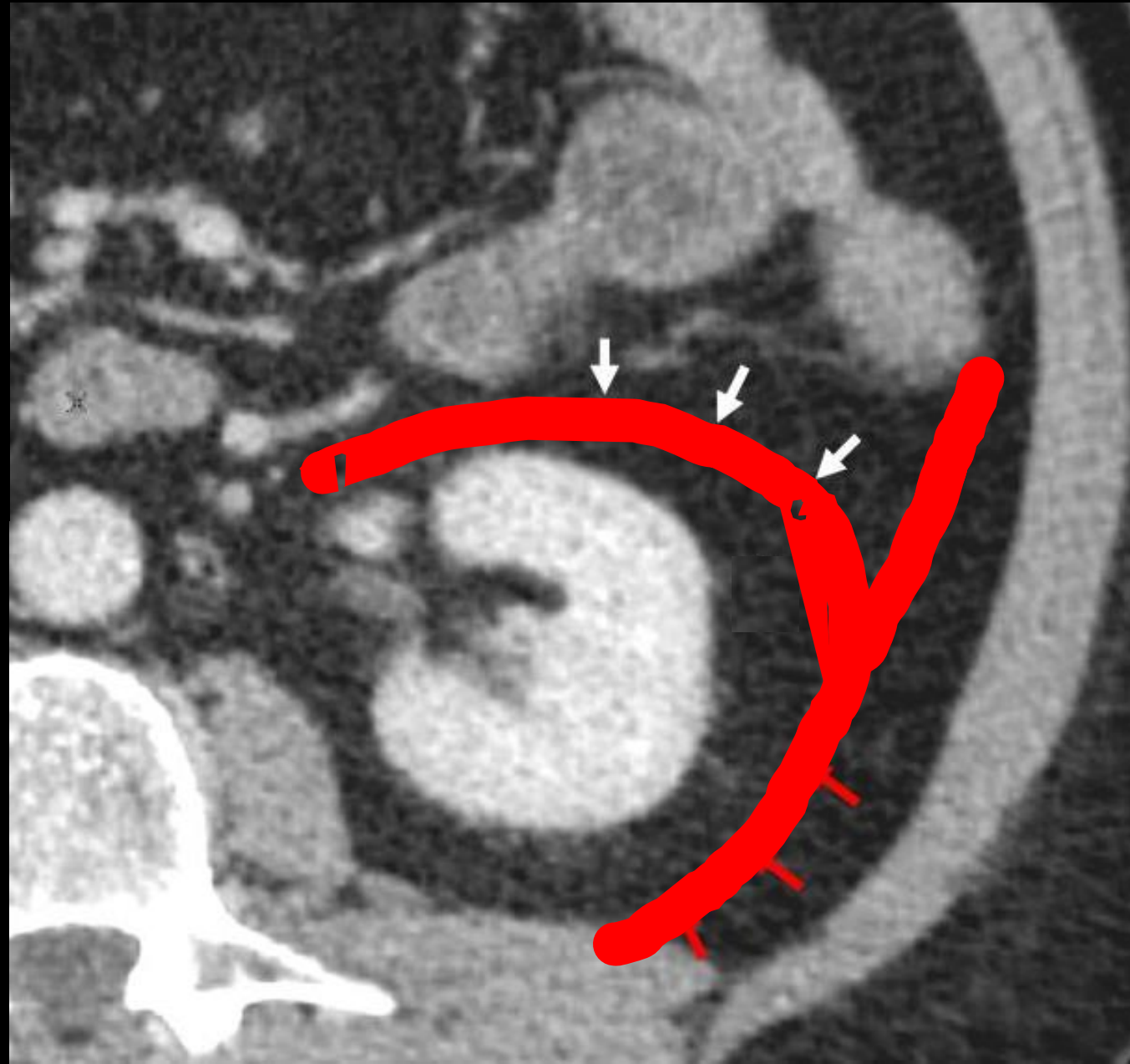
The Gerota and Zuckerkandel fascias fuse inferiorly, creating the Combined Interfascial Plane



Retroperitoneal Planes  
are constituted of juxtaposed membranes



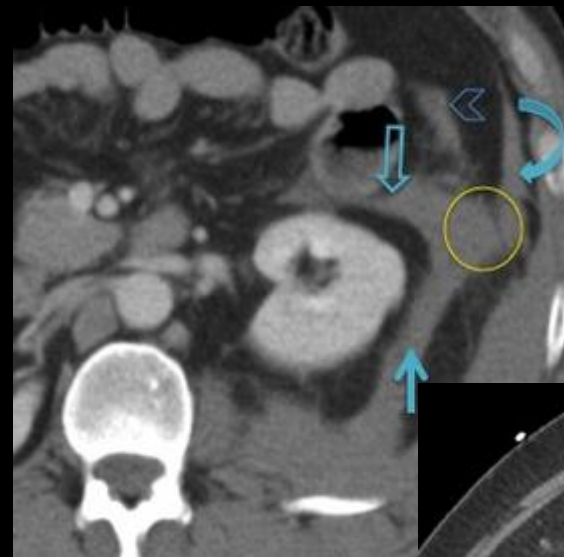
# Retroperitoneal Planes Behave like potential spaces



# Interfascial spread



# Interfascial spread



# Conclusions

- Familiarise yourselves with the causes of intra-abdominal haemorrhage
- Learn to recognise blood on CT and to spot the source of the haemorrhage
- Learn how blood spreads in the abdomen

*Thank you!*



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