CIRA CASE OF THE MONTH

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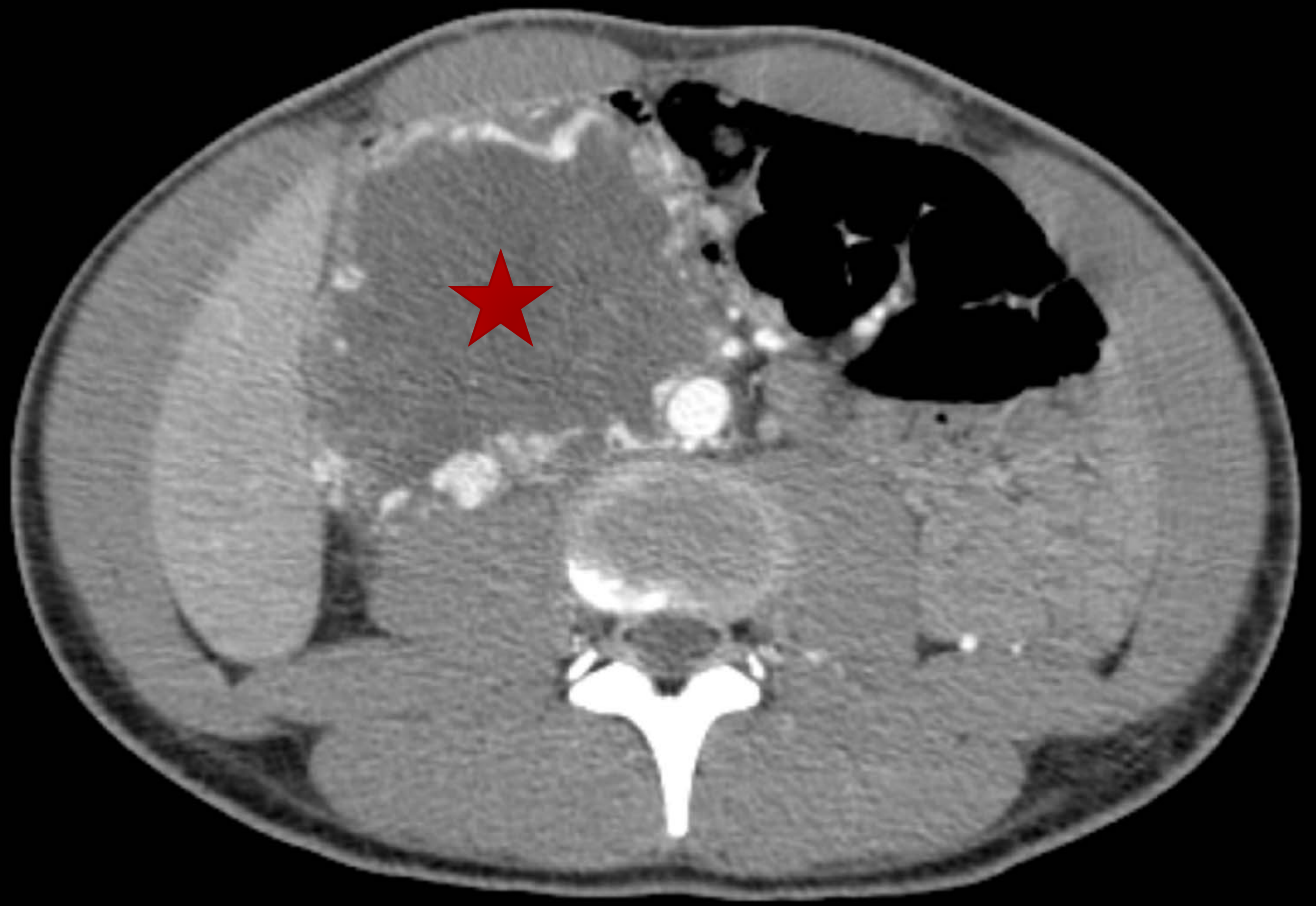
Case Courtesy of Drs. Simon Bradette, Guillaume Garneau and François Côté

Case Presentation

- 20 year old male, no past medical history
- Presented to the ER with a 5-day history of melena and extreme fatigue
- Physical exam notable for
  - Pallor and tachycardia
  - Blood on rectal digital exam
  - Right abdominal mass (10 cm)
- On admission, patient was anemic
  - Hgb = 55 g/L
  - Hct = 17%
- Gastroscopy and abdominal CT were performed

Abdominal CT Angiography



Case Presentation

- Gastroscopy
  - Important extrinsic duodenal compression
  - No invasion
  - No ulcer, no active bleeding
- Abdominal CT angiography
  - Right retroperitoneal mass (8 x 8 x 12 cm)
    - Necrotic with peripheral enhancement
  - Compression of the duodenum and IVC
  - Five hepatic lesions, largest in the left hepatic lobe (8 cm)
    - Necrotic with peripheral enhancement
  - Countless necrotic pulmonary nodules < 2.5 cm
  - No contrast extravasation

Case Presentation

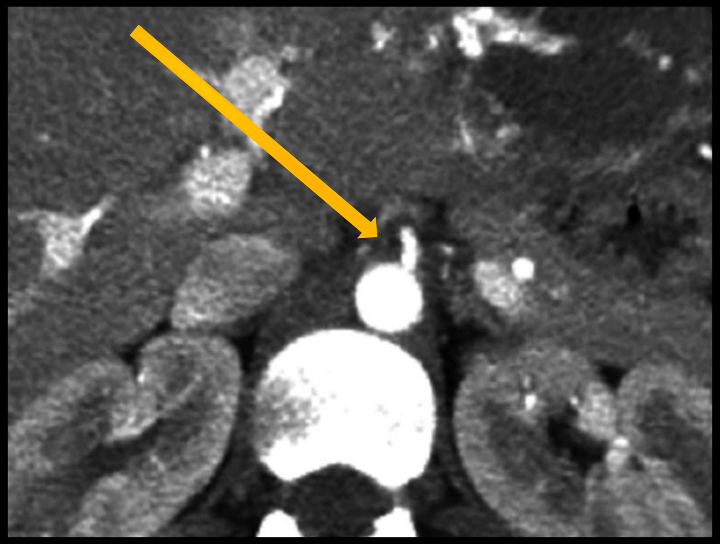
- Testicular ultrasound
  - Heterogeneous right testicular mass (6 x 7 x 6 cm)
- Diagnosis of metastatic testicular cancer established (stage IIIc NSGCT)
- Poor prognosis
  - Elevated tumour markers (AFP, β-hCG, LDH)
  - Non-pulmonary metastases

Case Presentation

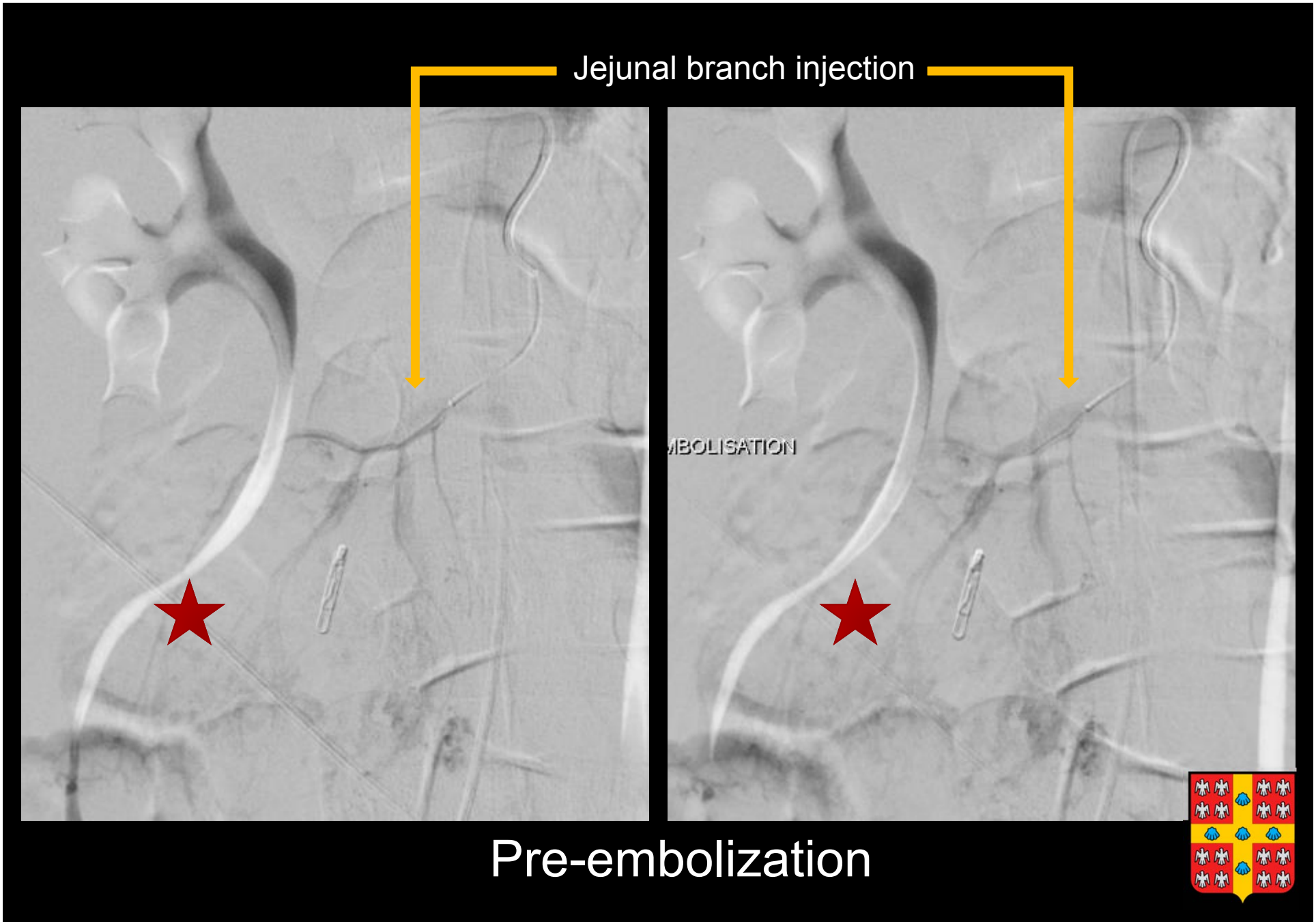
- Immediate transfer to an oncology center
  - Cisplatin, etoposide and bleomycin
- After 7 days of chemotherapy, recurrence of melena requiring blood transfusions
- Gastroscopy was repeated
  - Active arterial-like bleeding from the necrotic adenopathy ulcerating through the duodenum
  - No endoscopic treatment attempted except epinephrine injection
  - A clip was placed near the bleeding site
- Patient sent to interventional radiology for embolization

Procedure

- Right femoral approach
- Severe stenosis of the celiac artery was demonstrated
  - Median arcuate ligament syndrome?
- The origin of the superior mesenteric artery was catheterized




GDA
Celiac artery stenosis
Pancreatico-duodenal arcade
SMA injection


Jejunal branch injection
MBOLISATION
Pre-embolization

Procedure

- Hypervascular adenopathy with early venous return were noted
  - Near the presumed bleeding site
  - Probably originating from a jejunal branch
- There was no active contrast extravasation
  - Despite superselective catheterization of the jejunal branch
- Embolization with particles
  - Knowing the risk of intestinal ischemia
  - 700 and 900 µm Embozene particles were used
  - Good angiographic result

Post-embolization

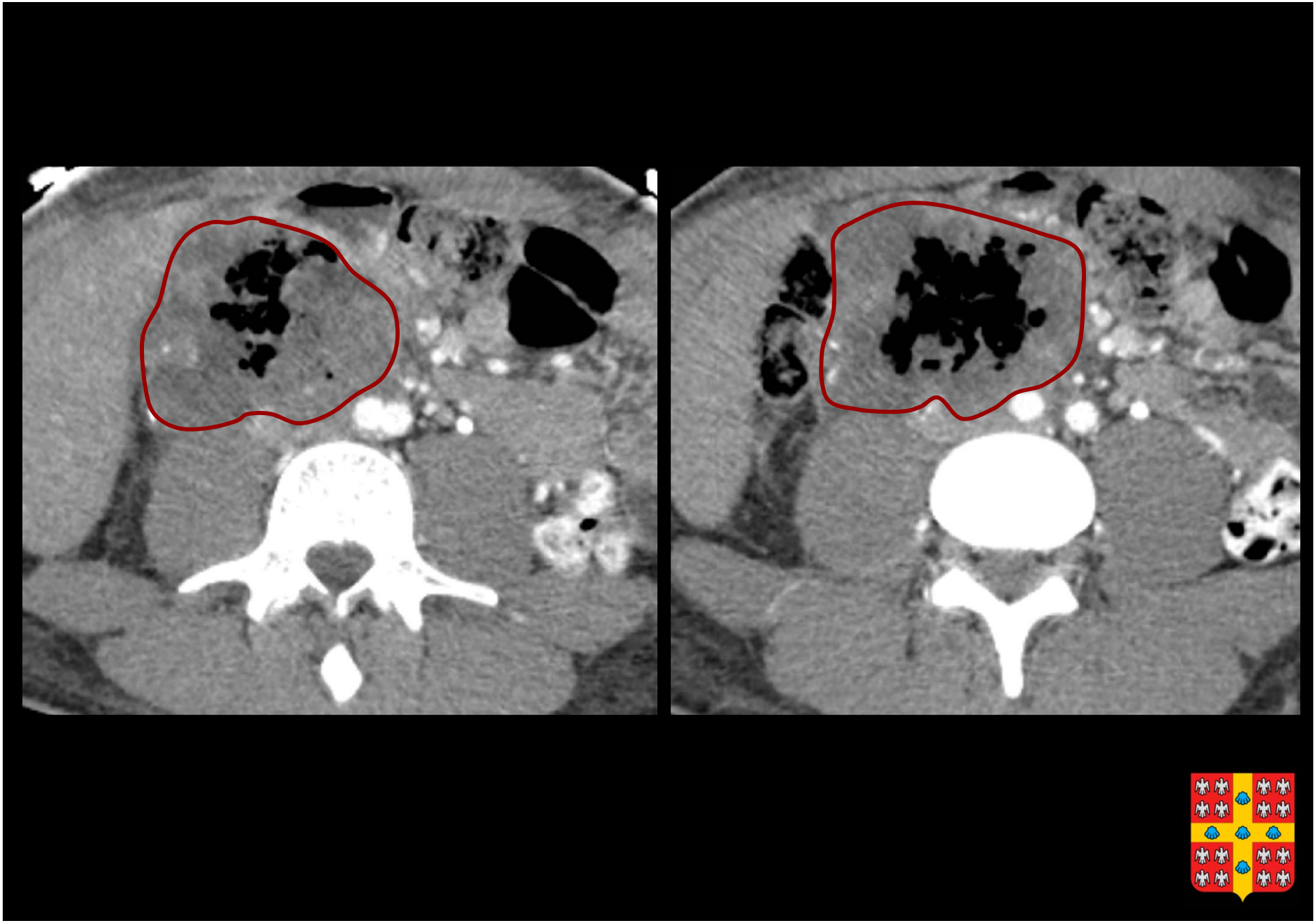
Post-Procedure Clinical Course

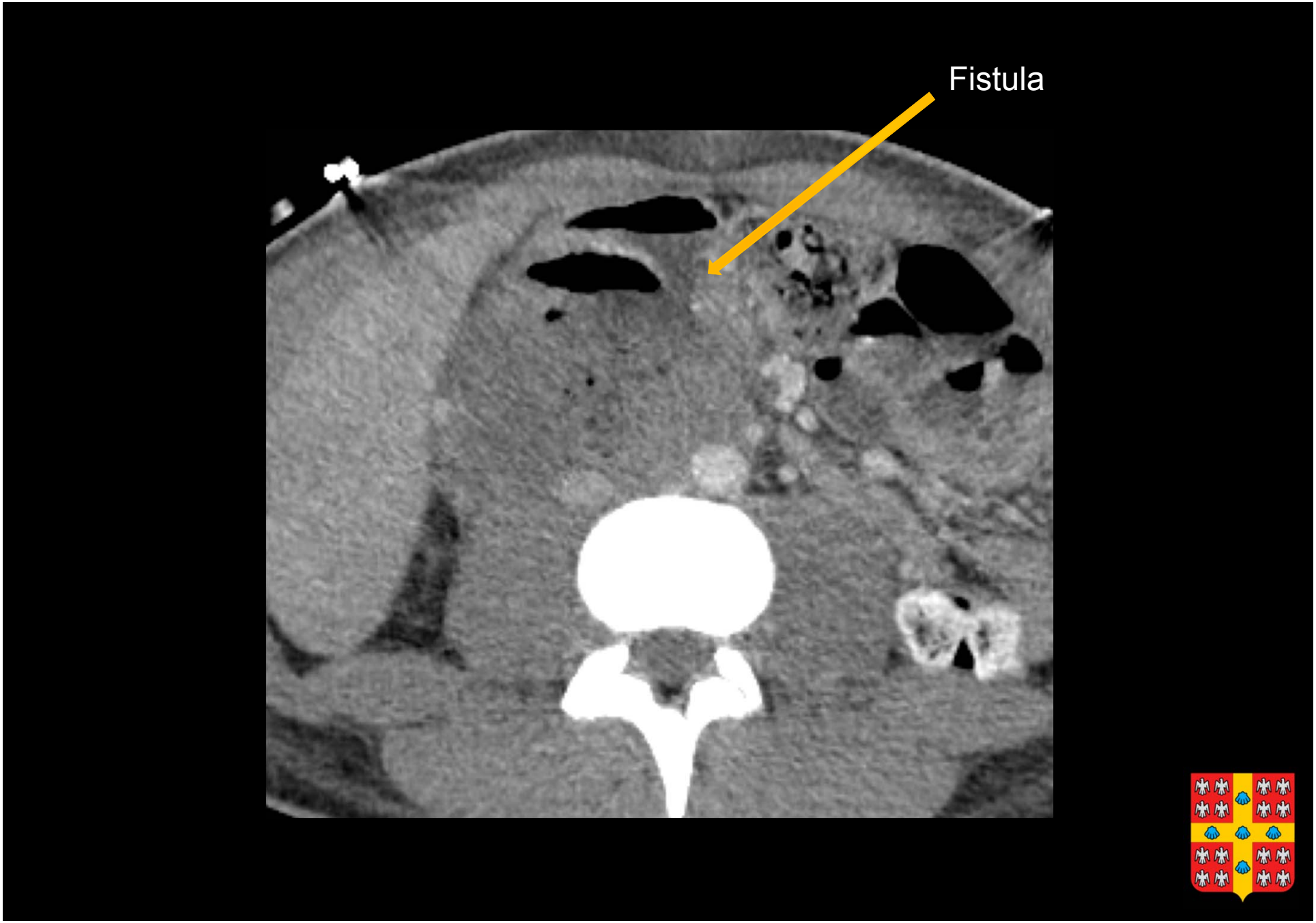
- Favorable clinical course
  - No sign of mesenteric ischemia or perforation
  - No recurrence of bleeding
  - Hgb stabilizes and increases (70 → 85)
  - Transfusions no longer needed

- Chemotherapy is continued

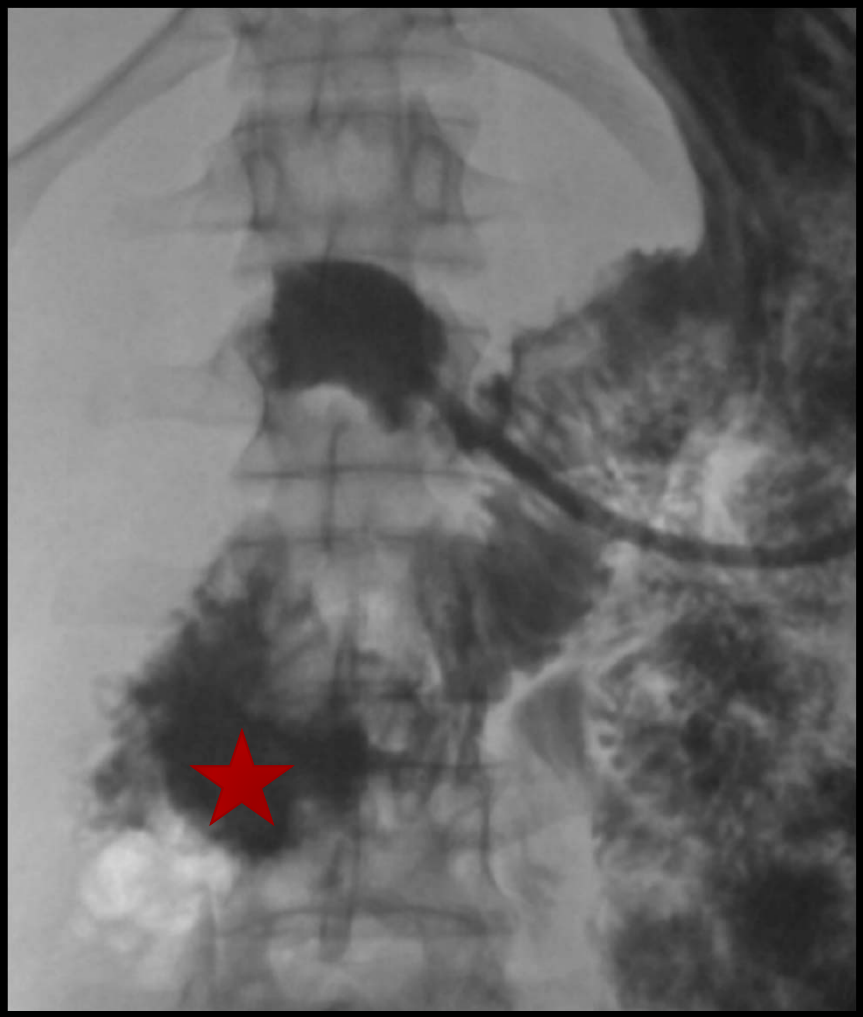
Clinical Course

- 16 days post-embolization, patient develops signs of sepsis
  - Fever (T = 39.4°C), thrills
  - HR 140 bpm, BP 112/60 → 90/40
  - WBC 12
- He is transferred to ICU where he is stabilized and receives antibiotics
- Abdominal CT angiography
  - Regression in size and peripheral vascularity of the retroperitoneal adenopathy
  - Free air within the adenopathy
  - Fistula identified between the duodenum (D2) and the adenopathy




Fistula

Upper GI Series

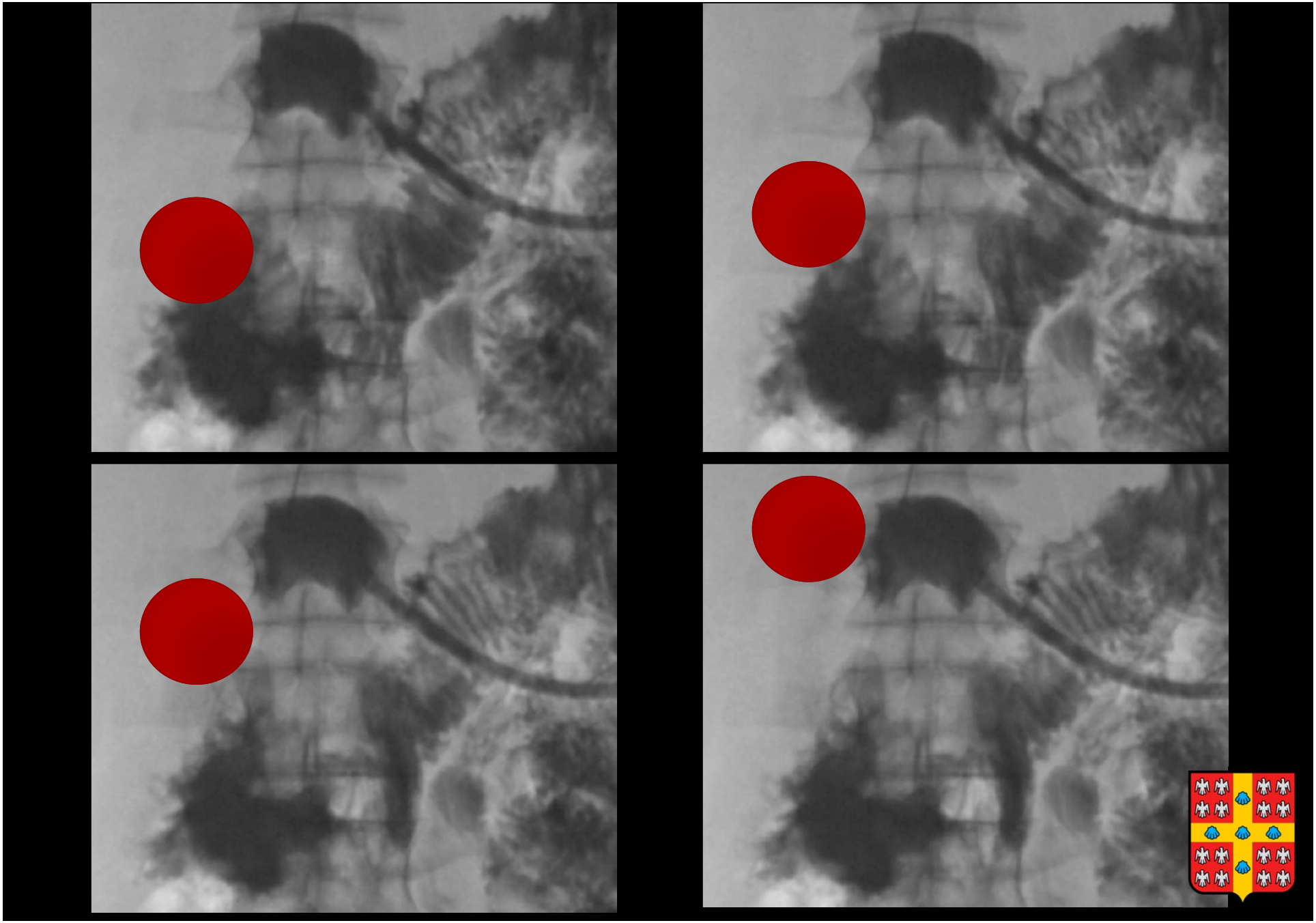


Upper GI Series

- Confirms the presence of a fistula between the duodenum (D2) and the retroperitoneal adenopathy

- However, the exam also shows…

…a fistula between the retroperitoneal adenopathy and the IVC

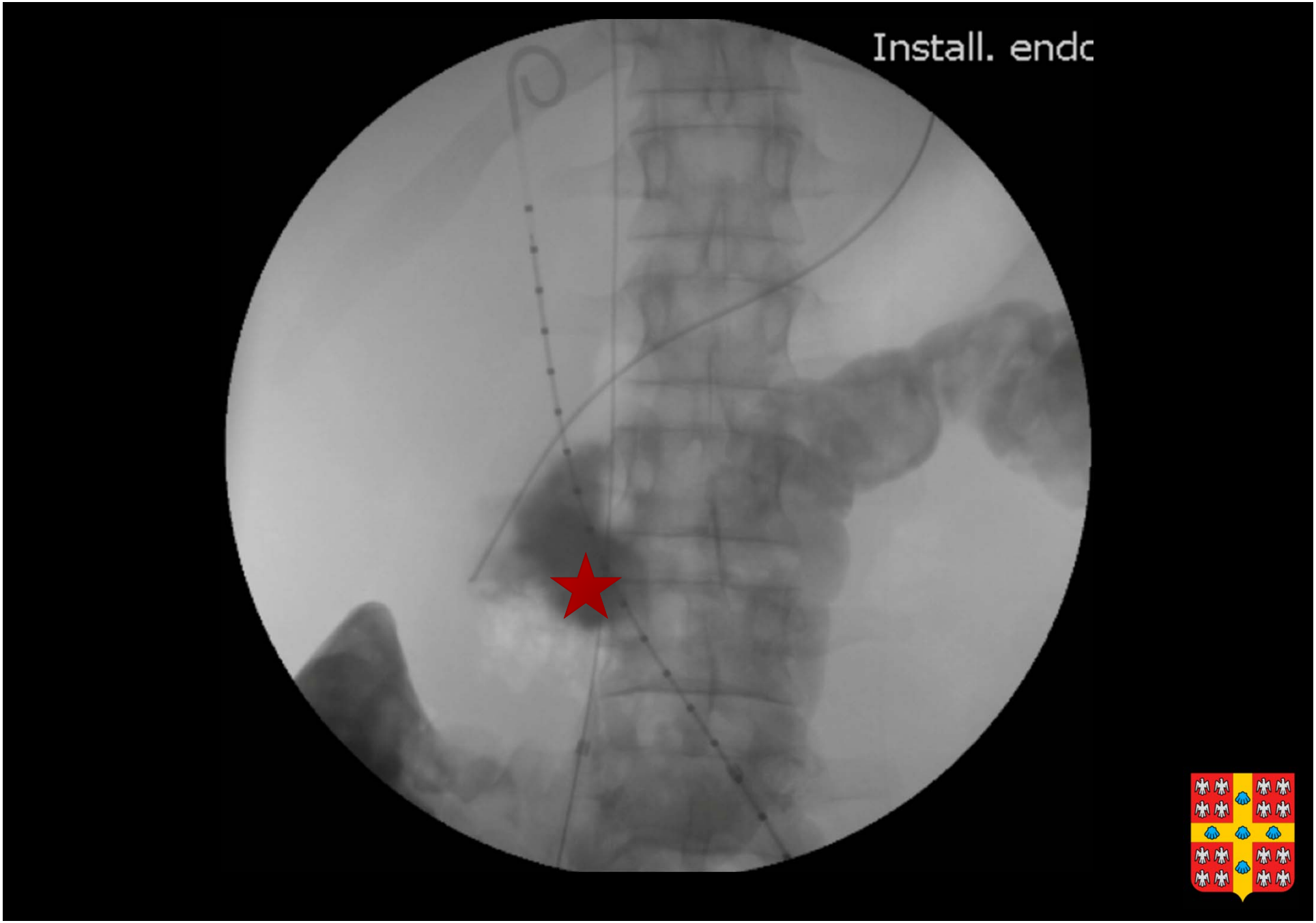


What can be done?

- Basically 2 options
  - Cessation of chemotherapy for immediate vascular surgery
  - Continuation of chemotherapy with temporary non-invasive management of the duodeno-caval fistula
- What can IR offer as a “bridging” treatment?
  - IVC stent-graft placement
  - Other options?
- Once more, patient sent to interventional radiology…

IVC Stent-Graft Placement

- Left femoral approach for cavography, which allowed
  - Identification of the renal veins
  - Measurement of the diameter of the IVC (25 mm)
- Right femoral approach for stent deployment
  - Surgical dissection
  - 16 F introducer sheath
- Stent-graft
  - Zenith alpha
  - 28 mm (d) x 109 mm (l)
  - Covered upper end: immediately under the lowest renal vein
  - Lower end: 2 cm above the iliac veins
  - Covers the presumed site of the fistula
  - Minimal fixation (barbs) but no extremity hooks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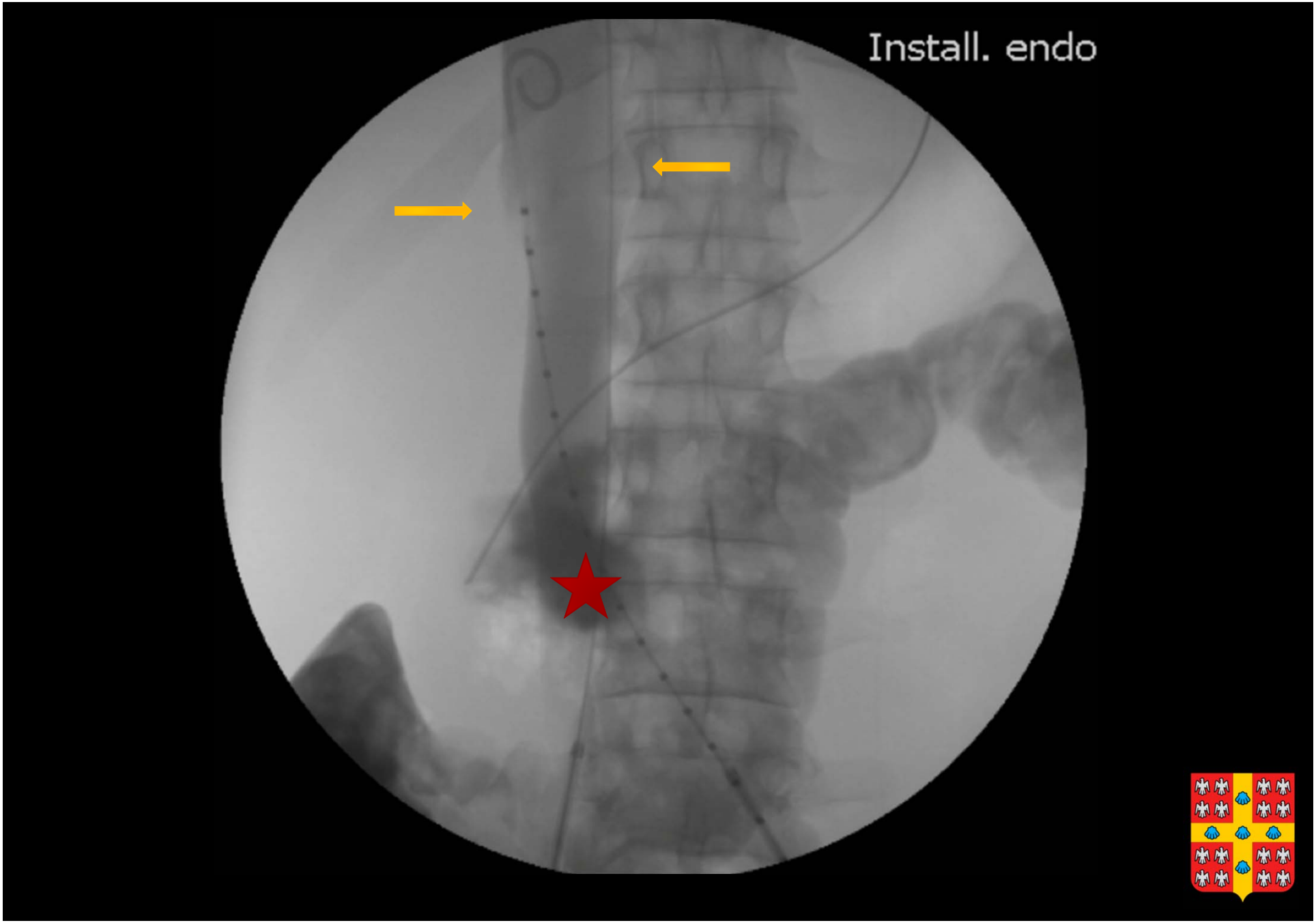
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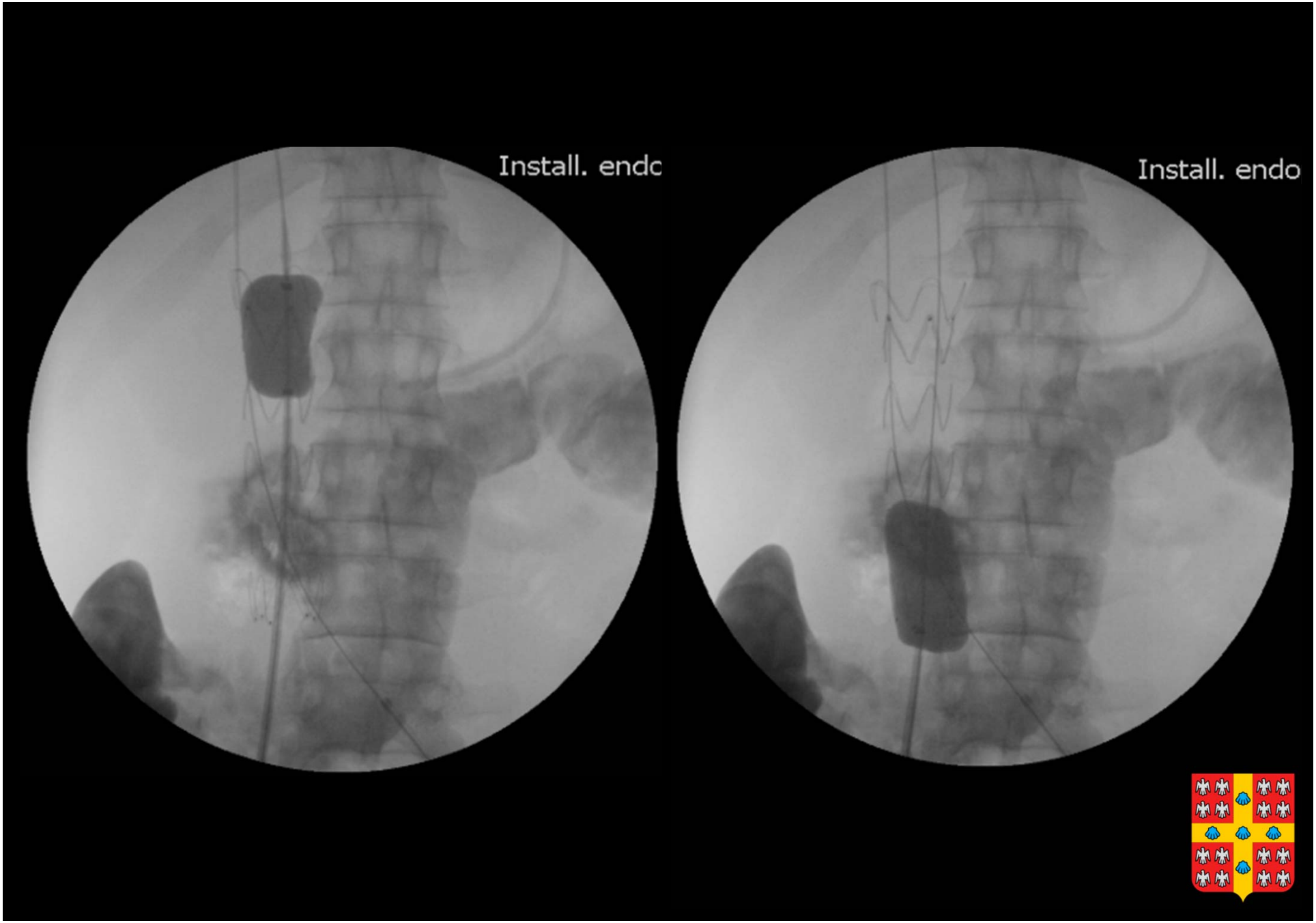
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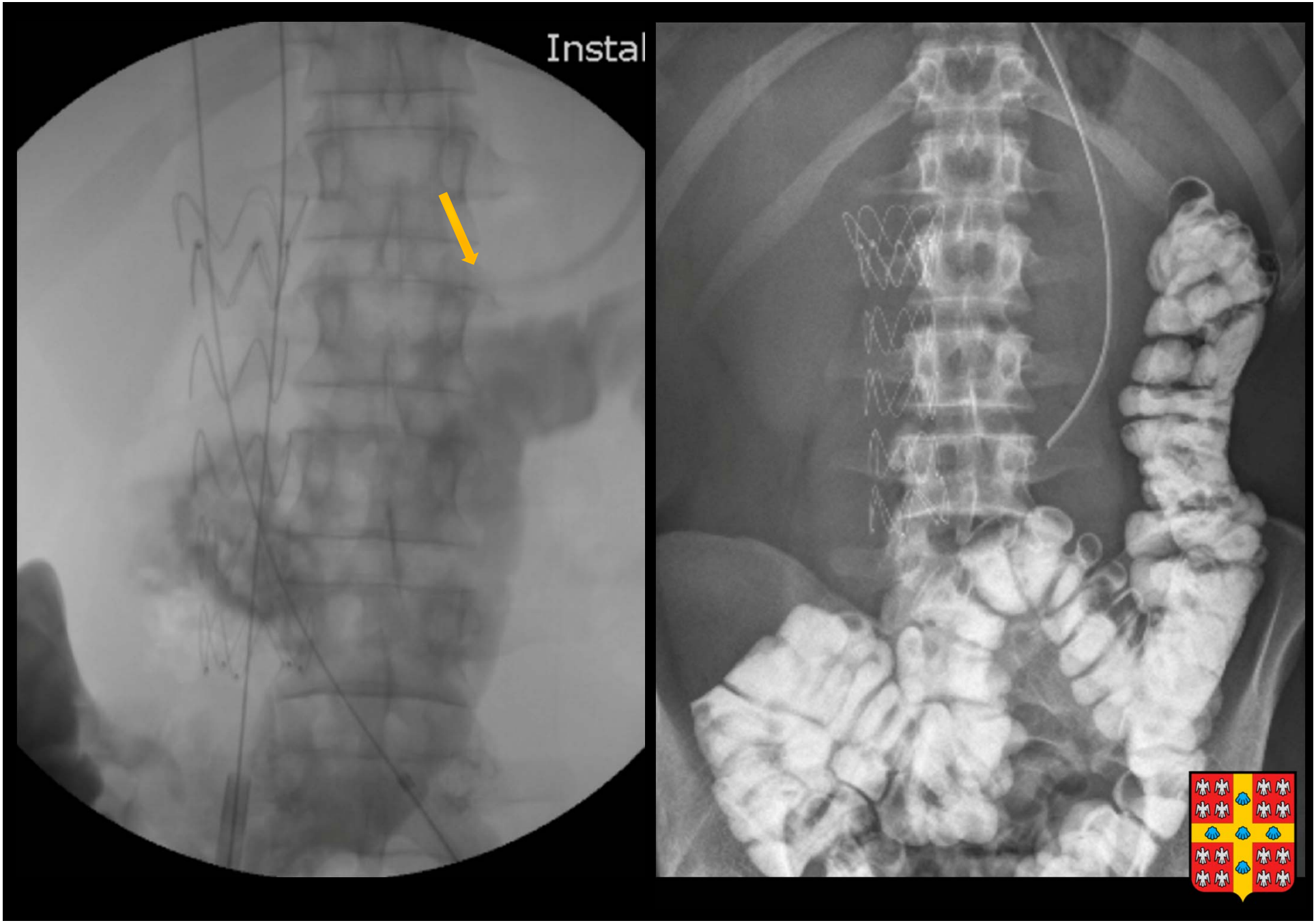
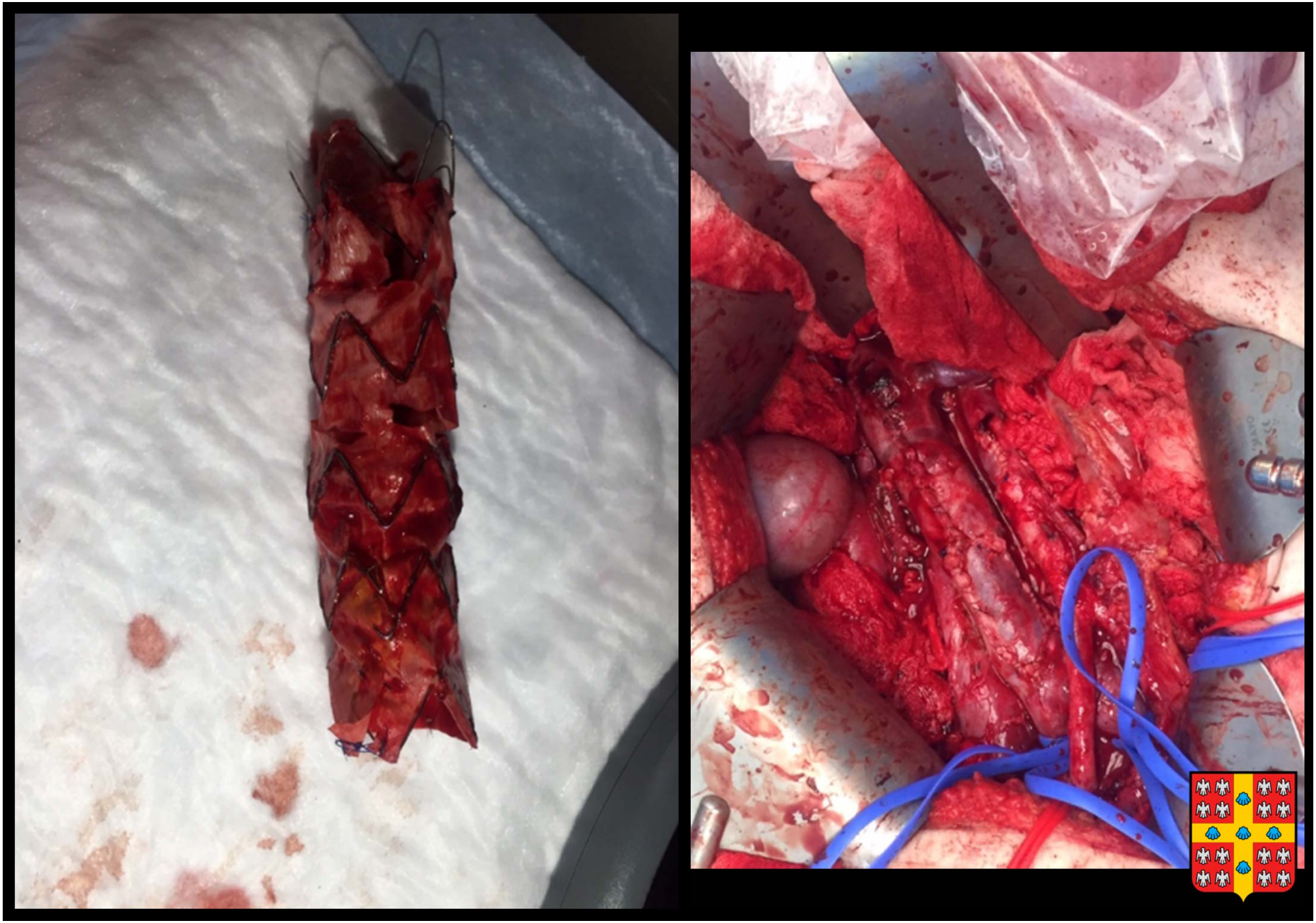

Instal

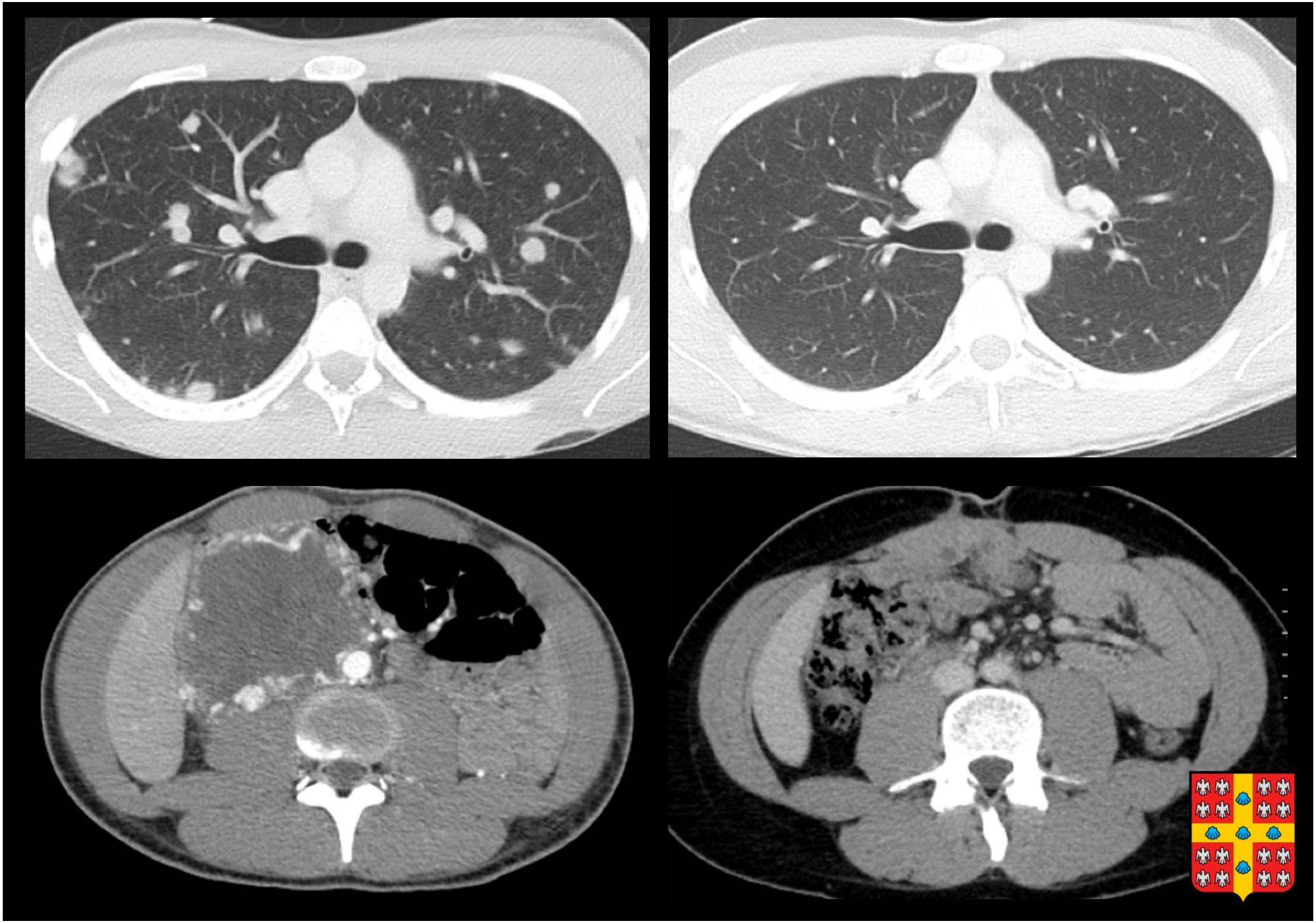
Post-Procedure Clinical Course

- Favorable clinical course
  - No recurrence of fever
  - Normalization of WBC's
  - Sepsis is controlled
- Long-term antibiotic therapy and parenteral nutrition
  - Meropenem/vancomycin/fluconazole
- Chemotherapy is continued
- But IVC stent-graft considered "infected"
  - Risk of abscess and septic thrombosis

Clinical Course

- Completion of chemotherapy (4 cycles, >2 months)
  - Excellent response
  - Normalization of tumour markers
  - PET scan: regression in size and activity of the retroperitoneal mass (but small faint residual hypermetabolic focus)
- Surgery 1 month after completion of chemotherapy
  - Stent-graft explantation and IVC angioplasty (with right superficial femoral vein graft)
  - Retroperitoneal lymphadenectomy
  - Duodeno-caval fistula repair (primary closure, no resection necessary)
  - Partial left hepatectomy (dominant liver metastasis in segments II-III)
  - Right orchiectomy





Vascular-Enteric Fistula

- Aorto-enteric fistula
  - Well known rare complication of AAA repair
  - Surgical repair is the definitive treatment (standard of care)
  - Endovascular management using stent-grafts is emerging in the literature as a bridging treatment
    - Safe and effective according to a few case reports and small series[1]
- Entero-caval fistula
  - Very rare complication of perforated duodenal ulcer or retroperitoneal surgery and radiotherapy
    - 35 cases reported in the literature[2]
  - Surgical repair is the only treatment reported
  - Nothing on endovascular management

Vena Cava Stenting

- Superior Vena Cava stent-graft implantation
  - Has been used successfully for years (first case in 1986) mainly for the treatment of superior vena cava syndrome (SVCS)
  - Safe and effective[3,4]
    - Technical success >95%
    - Clinical success >80%
    - Mortality/major complications <4%
- Inferior Vena Cava stent-graft implantation
  - A few reported cases in the literature[5,6,7]
  - Indications
    - Traumatic injury (control hemorrhage)
    - Aneurysm
    - Aorto-caval fistula (type II endoleak)
  - No reported case of IVC stenting in the treatment of entero-caval fistula

IVC Stenting

- Like any venous endografting, IVC stenting poses many challenges
- Stent migration is a major concern because the size of the IVC varies according to the hemodynamic status
  - Oversizing (20 %)
  - Distal active fixation (hooks and barbs) can been used with caution
- Other complications
  - Venous tears
  - Thrombosis (long-term patency?)
  - Side branch occlusion

Take-Home Messages

- In cases of vascular-enteric fistula, endovascular management using stent-grafts can be used as a bridging treatment to surgical repair
- IVC stenting is challenging
- Risk of stent migration may be minimized by oversizing
- Distal active fixation (with hooks or barbs) must be used with caution

References

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