I do not have any potential conflict of interest

Treatment of the nutcracker syndrome (NCS): The interventional radiologist's point of view

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❖ Numerous available treatments

1- **Endovascular treatments**

- Embolization of pelvic varicose veins and left ovarian vein
- Left renal vein stenting
- Association of the two procedures

2- **open surgical correction**

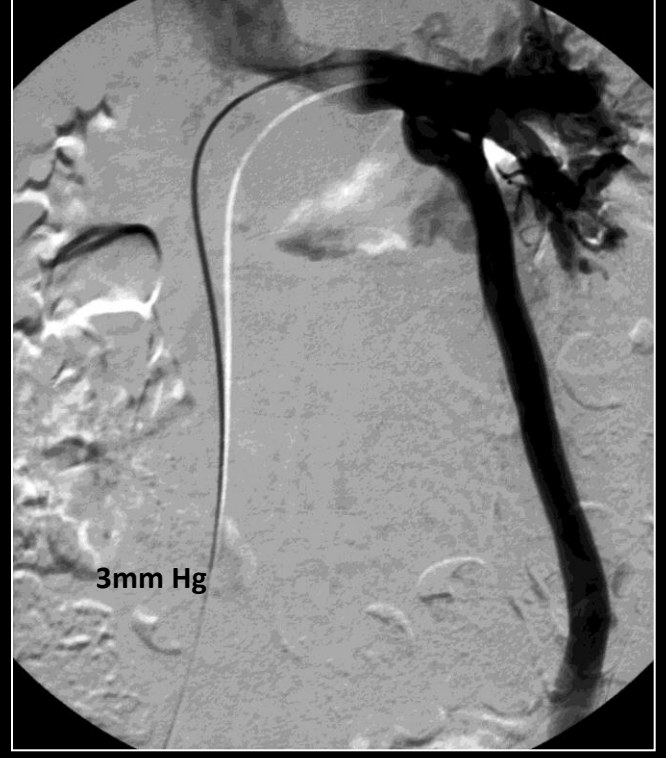
different procedures of varying complexity: the most common surgery is the left renal vein transposition

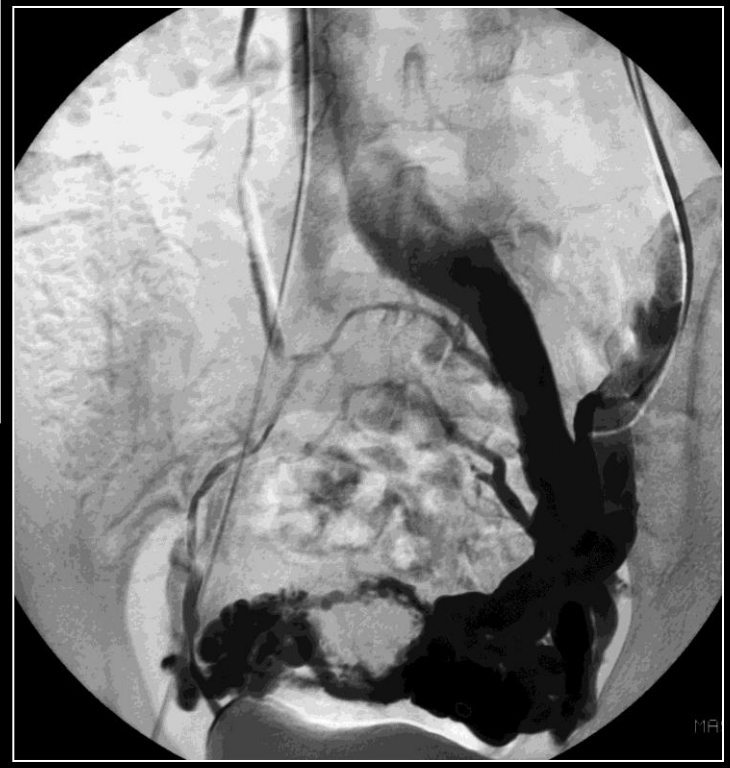
All the procedures have their limits and their complications
That is to say their indications and their contra indications

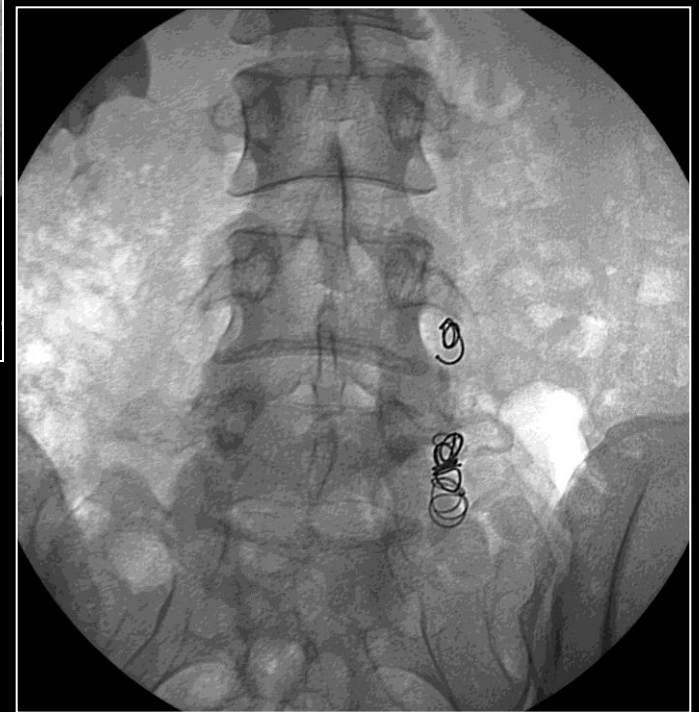
1- embolisation of pelvic varicose veins and left ovarian vein for treating pelvic symptoms

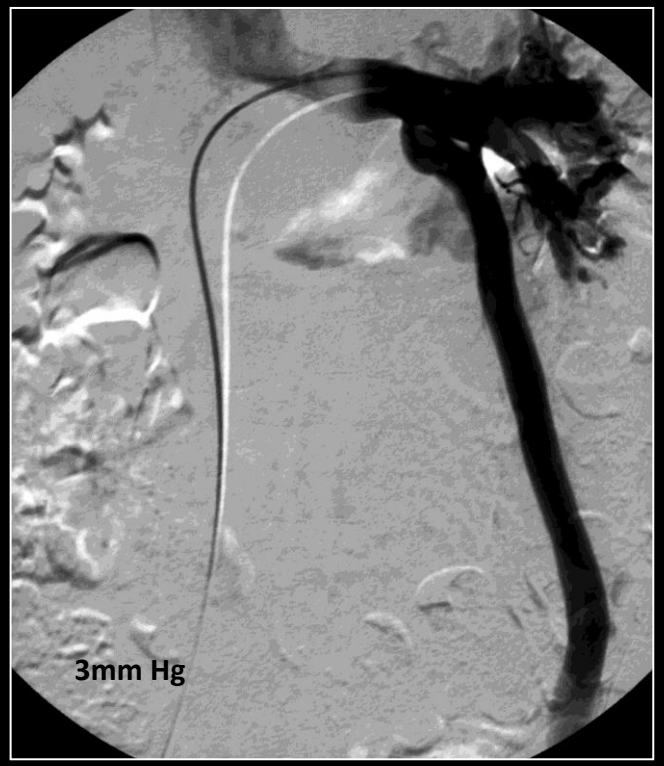
warning: caution should be exercised

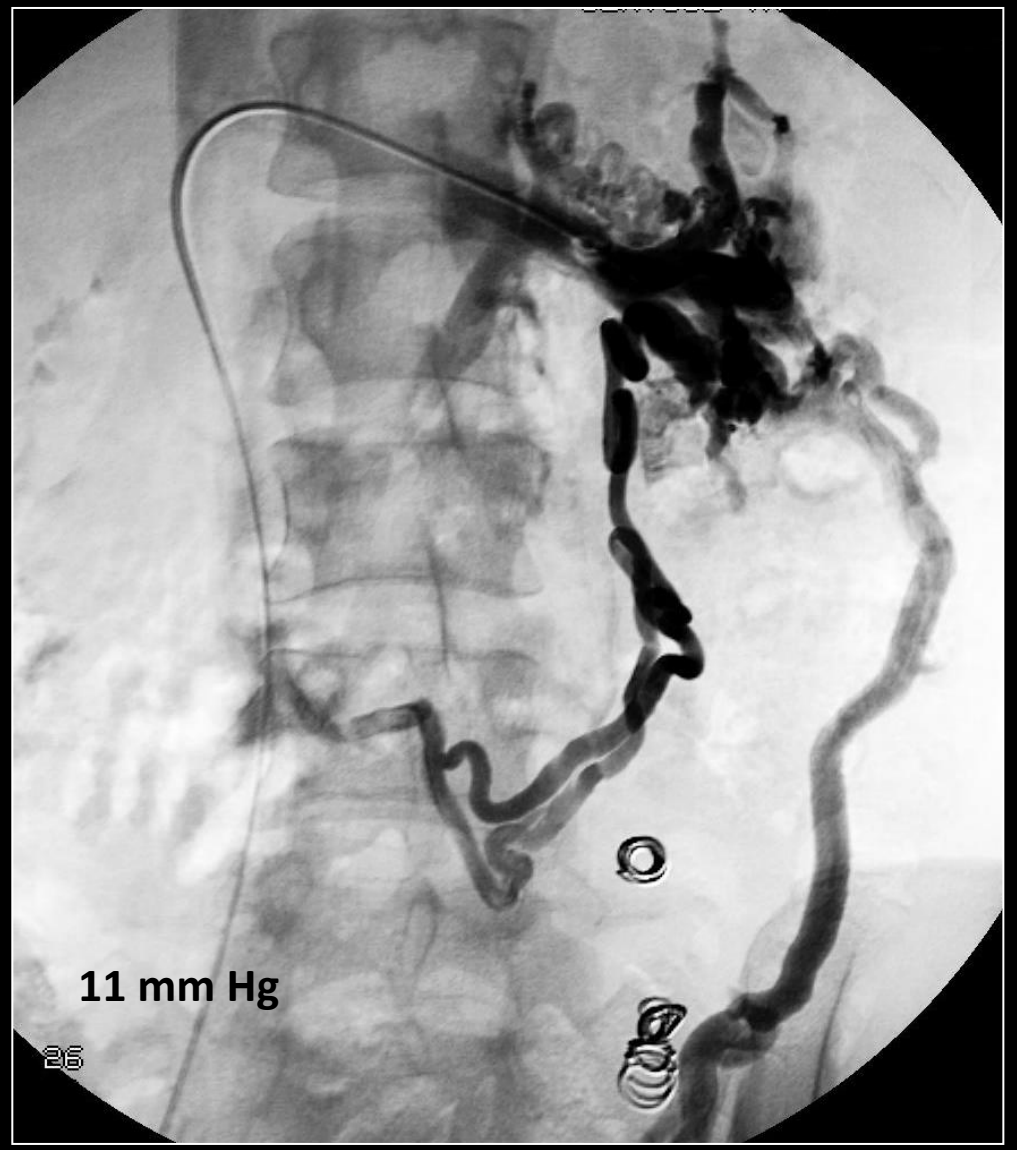
1) When the ovarian vein is the only derivation
2) When the reno-caval pressure gradient is high
3) When there is a chronic hematuria
4) When the patient is not told of his anomaly
5) When the patient has not signed document recognising the potential risks of the embolization and the need for further medical screening


3mm Hg







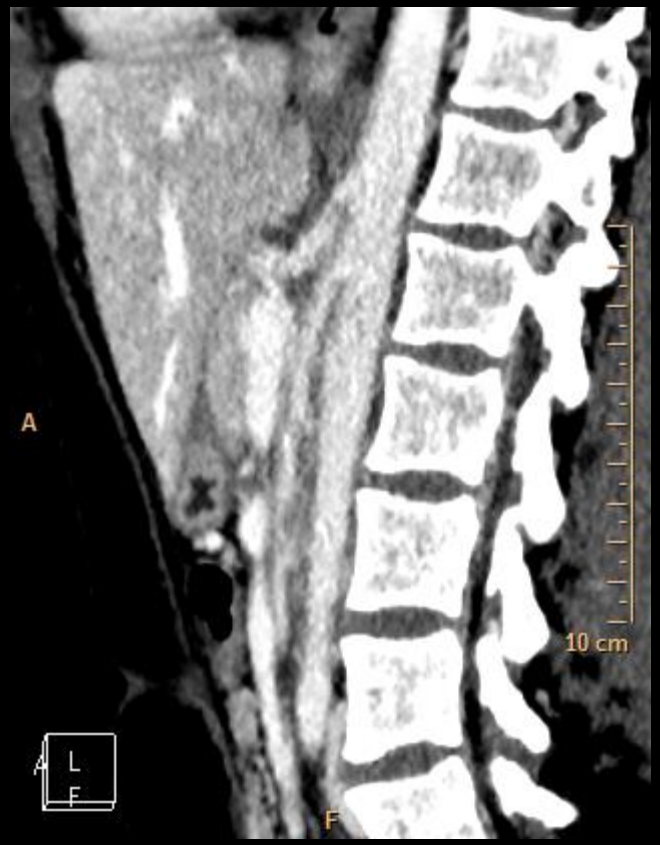


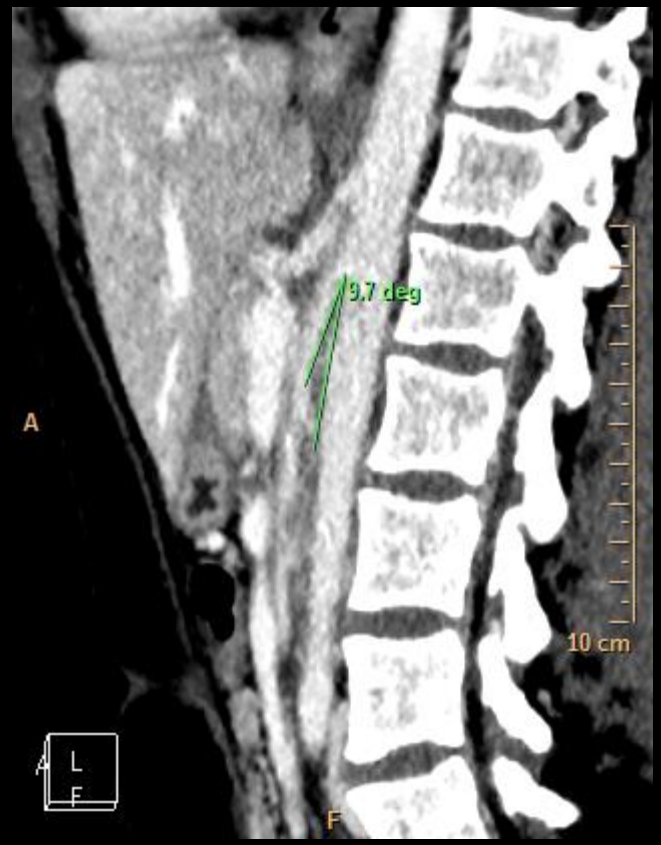
five years after only embolization and a pregnancy later (without problems)

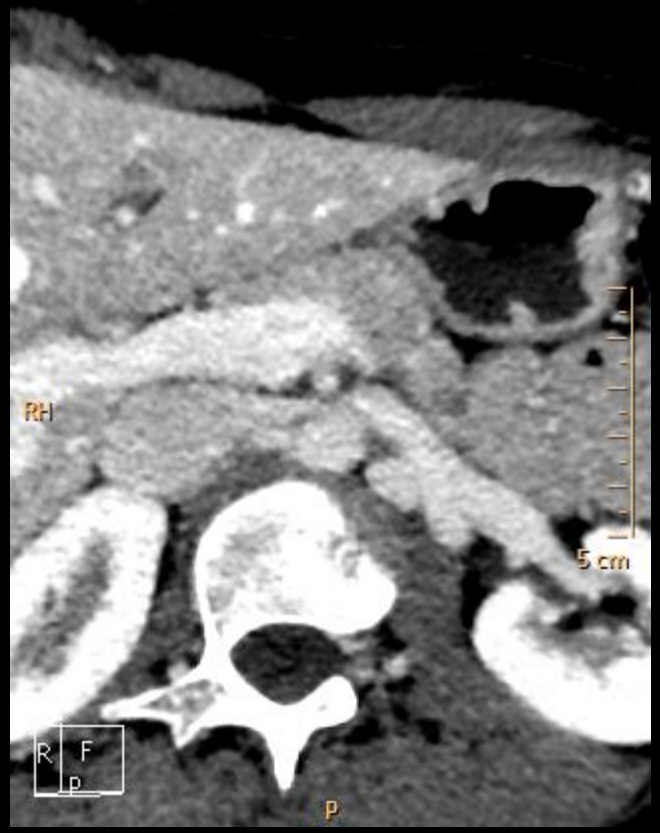
2- Left Renal Vein stenting

Be careful when

2a - The aorto-mesenteric angle is very acute and LRV is at the apex of the angle







2- LRV stenting

- Major complication : stent migration, sometimes later

  (mainly related to the size of the stent, the type of the stent, the technic, the aorto-mesenteric angle.)

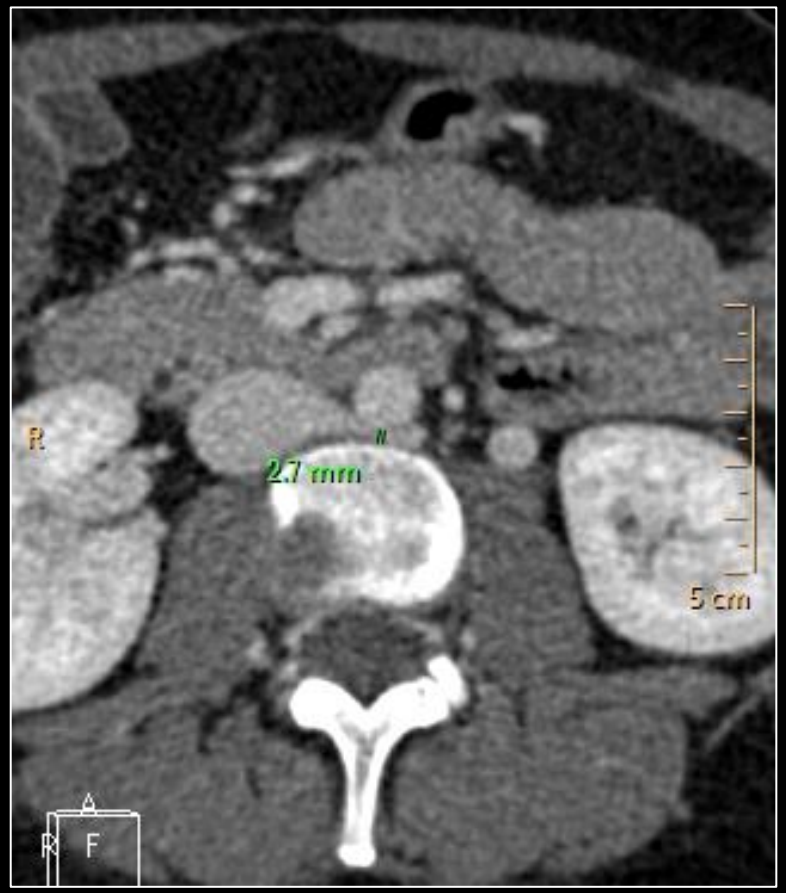
- Migration into the IVC [1,2, 3]
- Migration into the right atrium (open cardiac surgery) [2]
- Retrograde migration into a collateral of LRV (surgical retrieval) [3]

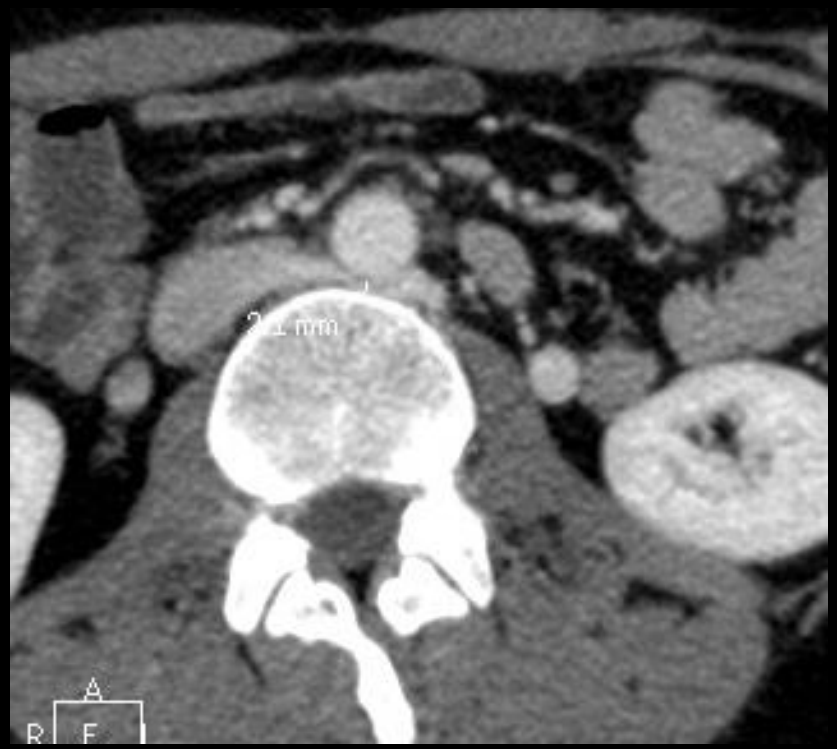
- *In stent stenosis and thrombosis: scarce*
- *Potential concerns: stent deformities and erosion at the placement site*

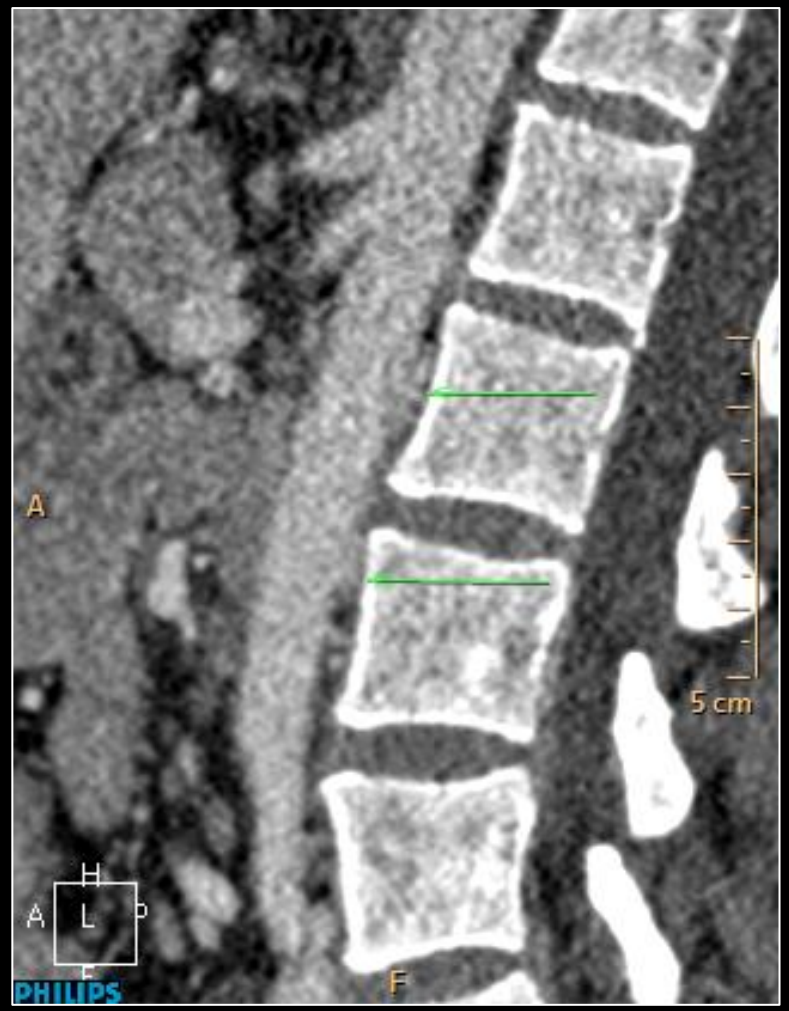
1 Hartung O, Grisoldi D, Boufi M et al. Endovascular stenting in the treatment of pelvic vein congestion caused by nutcracker syndrome: lessons learned from the first five cases. J Vasc Surg 2005; 42: 275-80.
2 Chen S, Zhang H, Shi H et al. Endovascular stenting for tretment of nutcracker syndrome: report of 61 cases with long-term follow-up. J Urol 2011; 186: 570-5.
3 Wang X, Zhang Y, Li and Zng H. Resuts of endovascular treatment for patients with nutcracker syndrome. J Vasc Surg : 2012; 56: 142- 148.

Be careful when

2b- The entrapment of the retro-aortic left renal vein is very tight



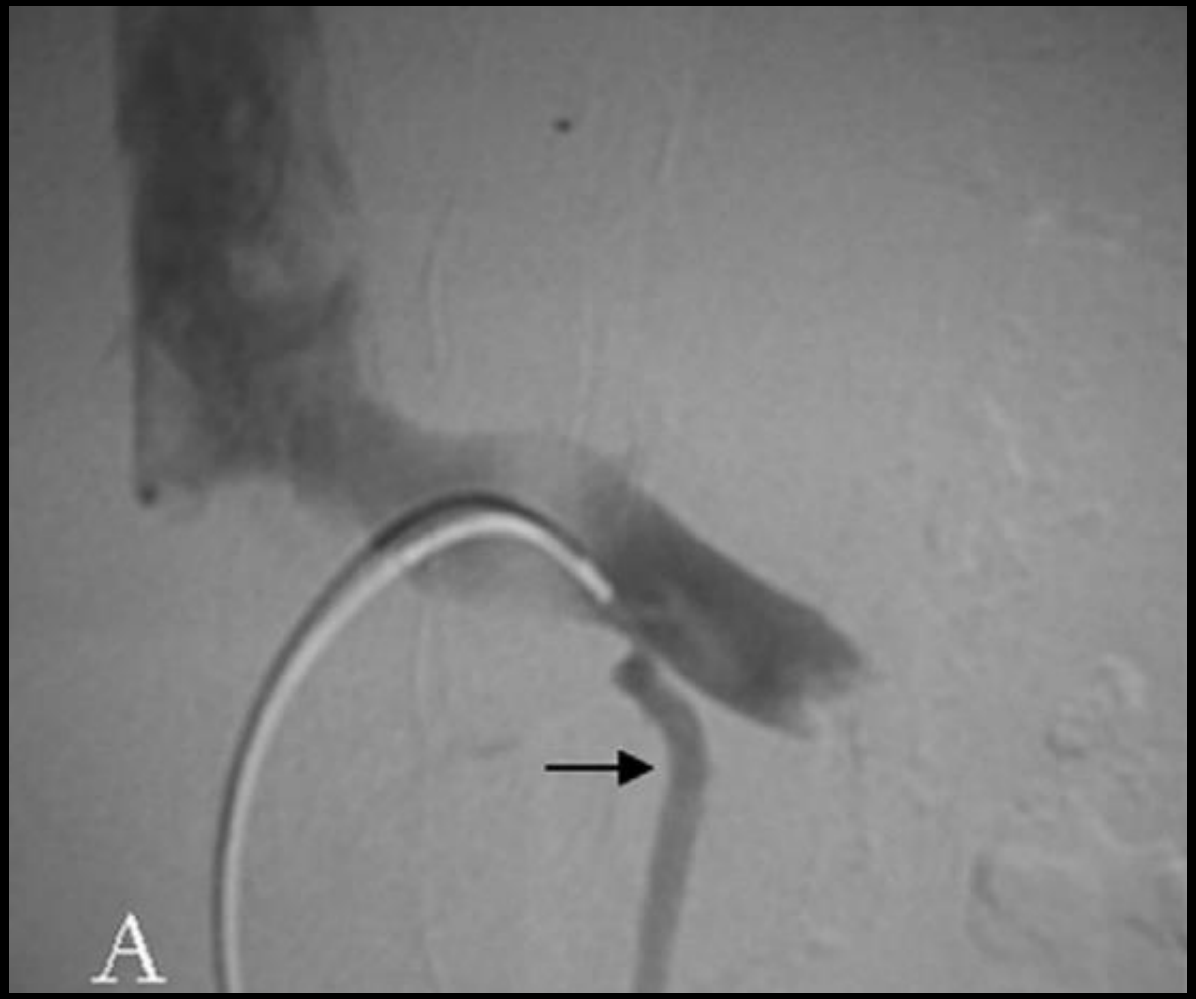




warning: the vexing problem of some publications which are cited as references

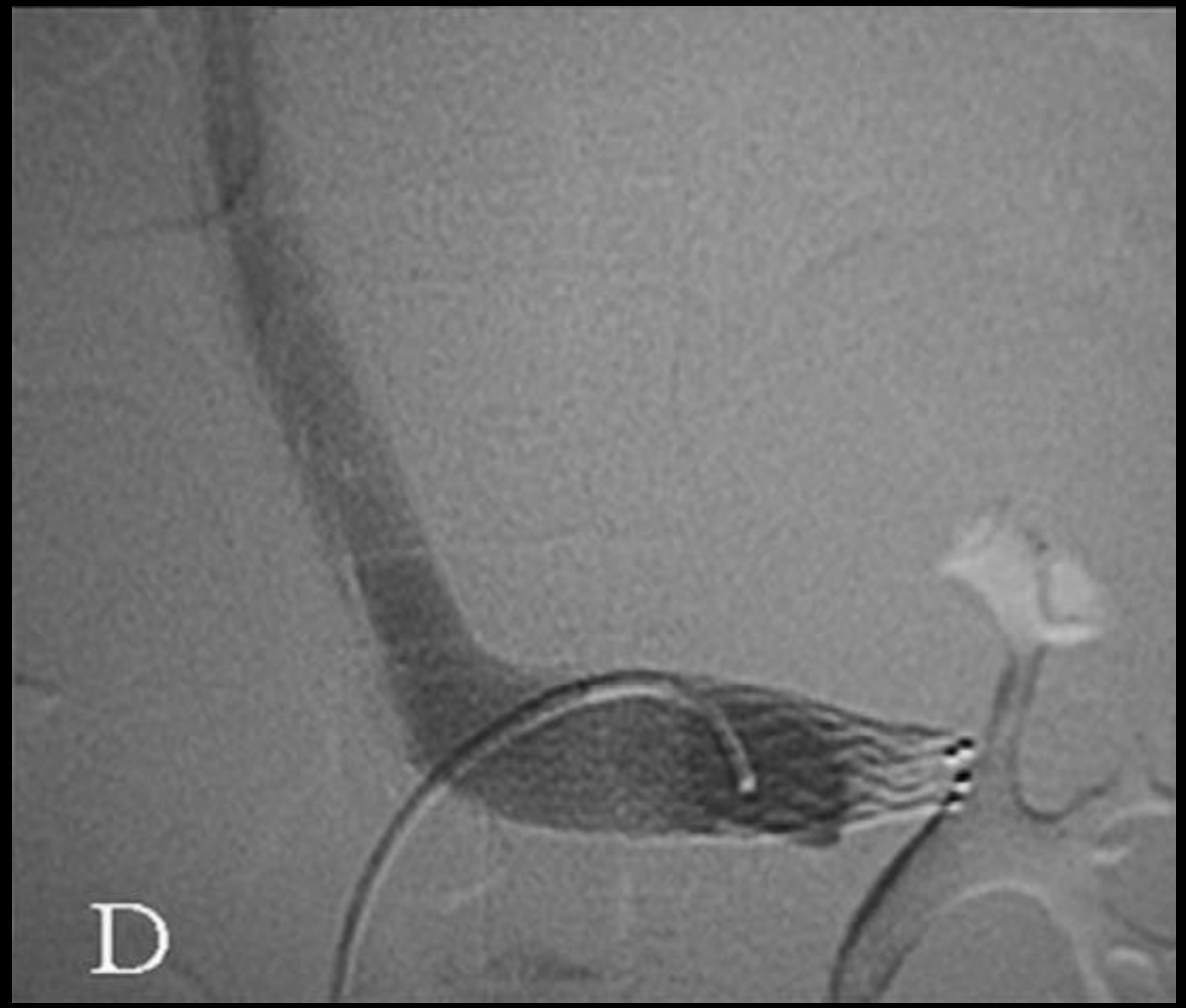
And which recommend endovascular stenting as primary option for the treatment of nutcracker syndromes.

Wang X, Zhang Y, Li C and Zhang H. Resuts of endovascular treatment for patients with nutcracker syndrome. ***J Vasc Surg*** *: 2012; 56, 1; 142- 148*



« A : Selective left renal phlebography showed stenosis of the left renal vein with dye stagnation and large collateral pathways (left gonadal vein) (arrow) »

« D: Completion venography within the stent before the sheath was retrieved , showing the stenosis of the LRV was relieved. To achieve good fixation, the distal (left) end of the stent was deployed in the first large branch of the LRV »

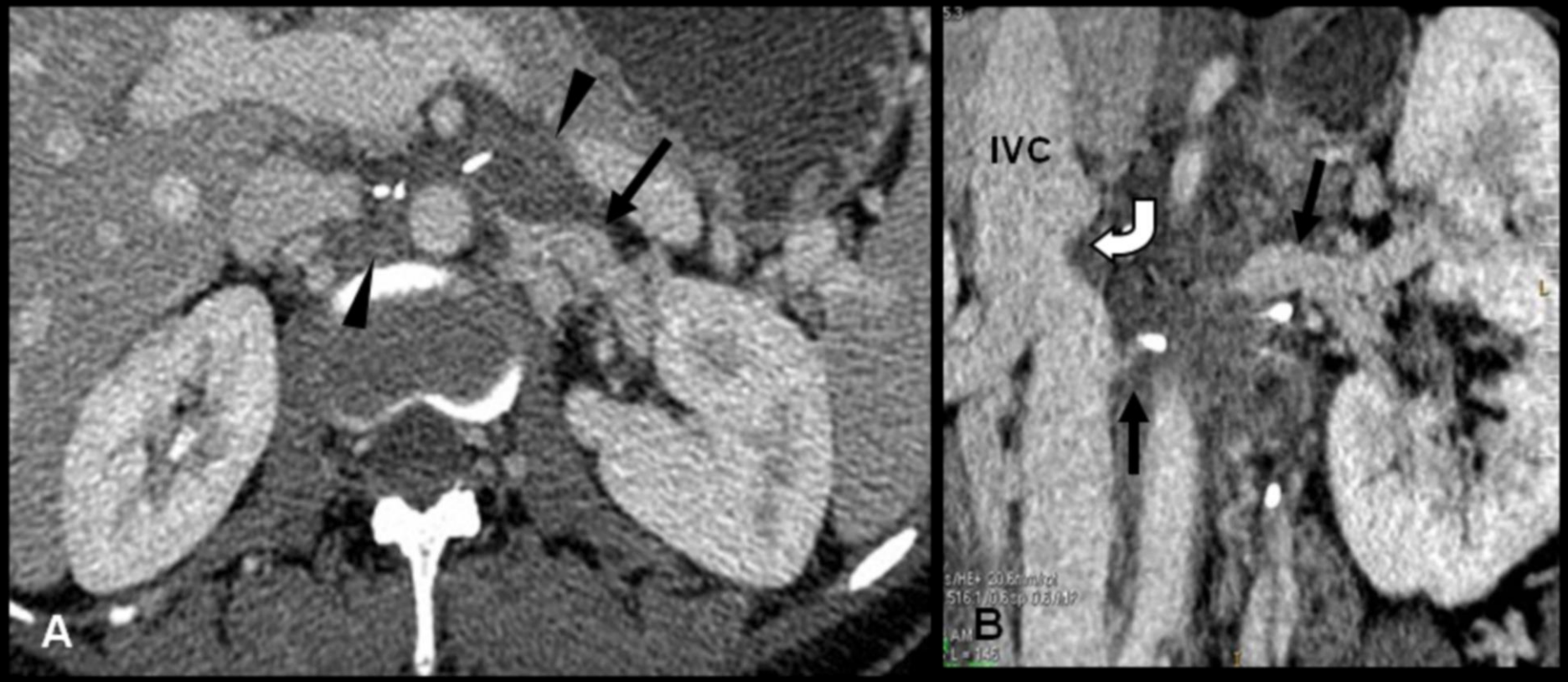


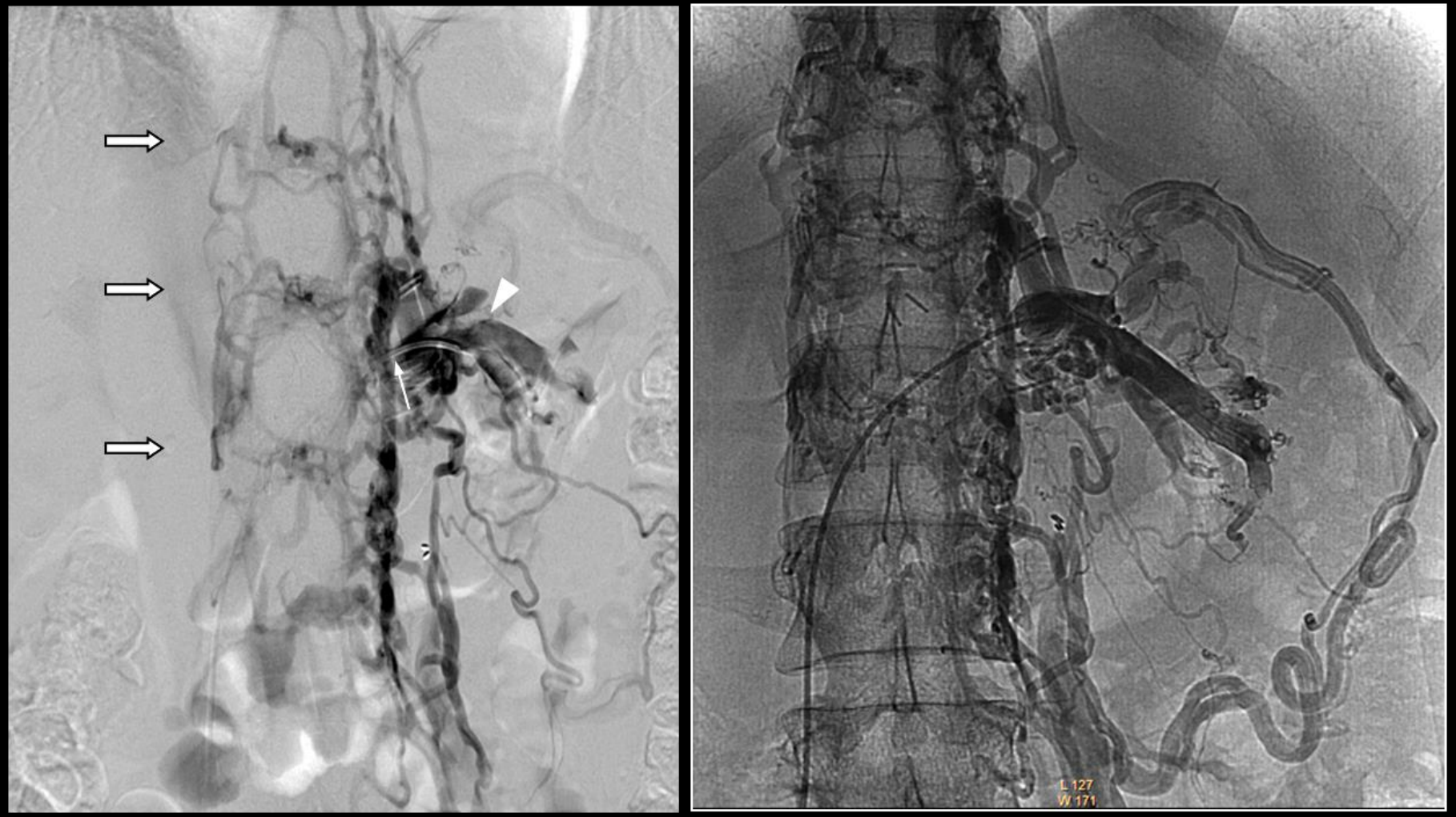
Wang X, Zhang Y, Li and Zng H. Resuts of endovascular treatment for patients with nutcracker syndrome. J Vasc Surg : 2012; 56, 1; 142- 148

3- Left renal vein open surgery

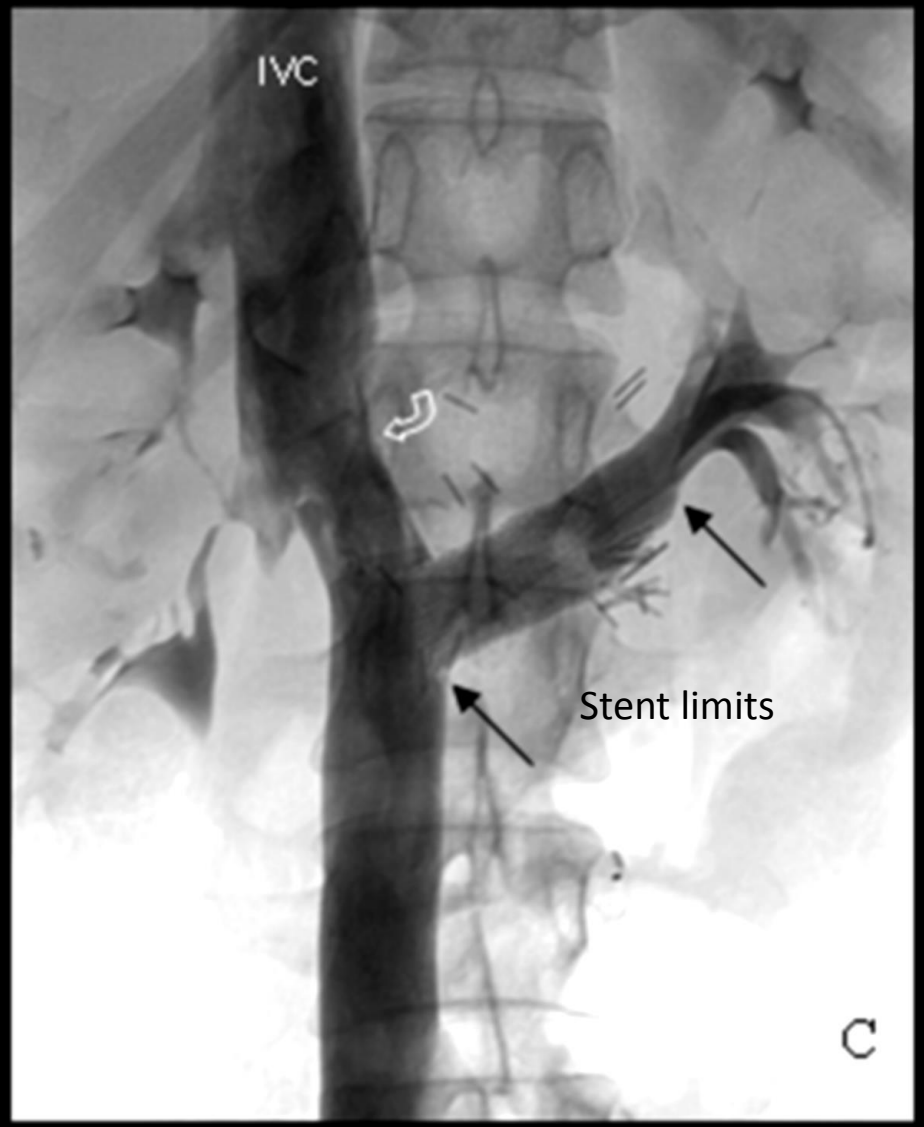
higher morbidity

non negligible post-operative complication rate

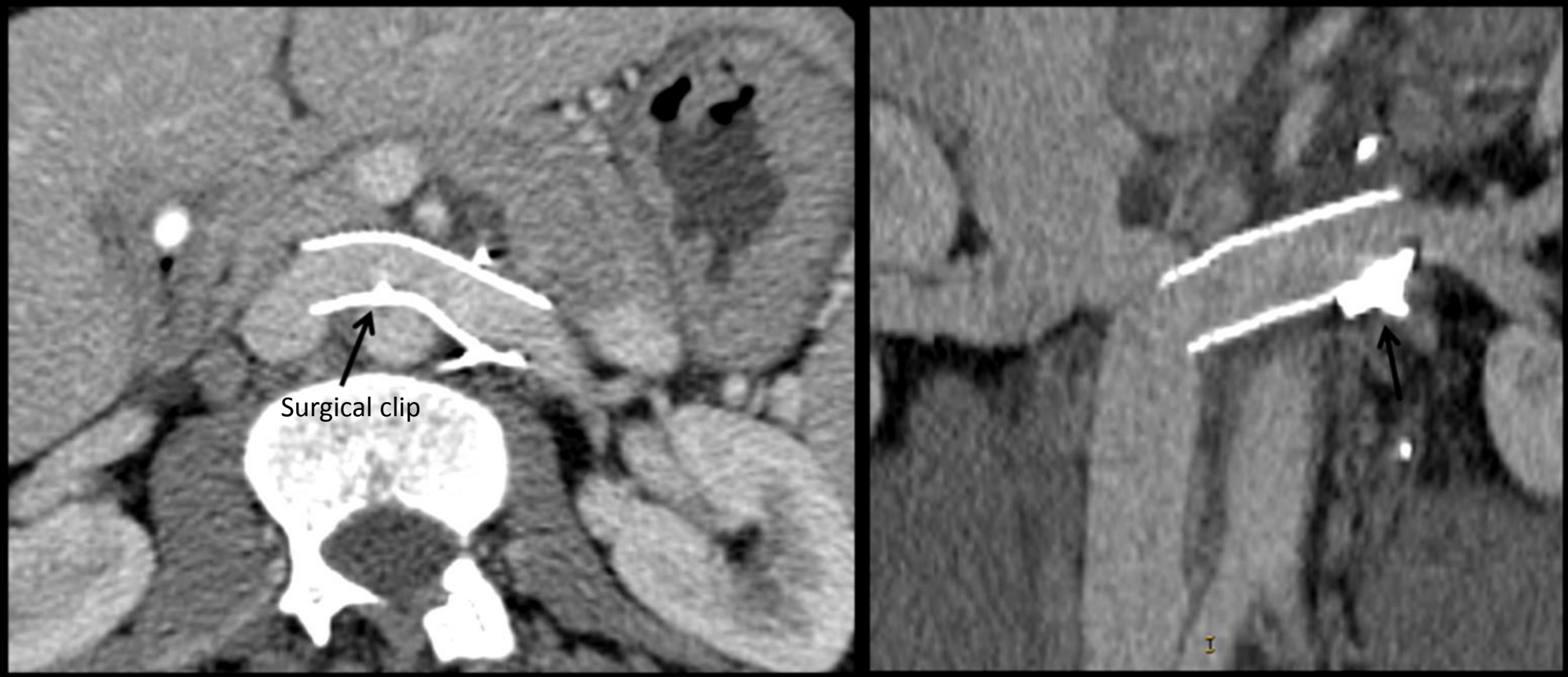




Control after recanalization of the LRV



Same patient: LRV stenting



Same patient: 8 year follow-up

warning: procedure under robotics are not a satisfactory development

because of the technical impossibility of extending the LRV with a patch

Conclusion

The NCS is not an easy pathology to deal with because it is not an uniform pathology and it requires a great expertise in the field.

In NCS, therapeutic indications are linked to the degree of severity of the compression and to its clinical consequences. They must be documented and carefully weighed.