Single Center Experience with Open and Endovascular Treatment of the Nutcracker Syndrome

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Disclosure

Speaker name:

I have the following potential conflicts of interest to report:

☐ Consulting

☐ Employment in industry

☐ Stockholder of a healthcare company

☐ Owner of a healthcare company

☐ Other(s)

☒ I do not have any potential conflict of interest
Nutcracker Phenomenon

- Compression of LRV
- Venous Hypertension in distal LRV
- Narrowing in proximal LRV
Nutcracker Phenomenon
Gravitation

Wide angle between the aorta and the superior mesenteric artery in quadruped mammals.

Narrow angle between the aorta and the superior mesenteric artery in the upright standing man.

- Aorta
- Superior mesenteric artery
- Left renal vein – non-compressed
- Vertical force of gravity on the bowel and its supplying artery
- Aorta
- Superior mesenteric artery
- Left renal vein – compressed
- Vertical force of gravity on the bowel and its supplying artery
Anterior Nutcracker Syndrome (ANS)

LRV between Superior Mesenteric Artery and Abdominal Aorta
Posterior Nutcracker Syndrome (PNS)

LRV between Abdominal Aorta and Lumbar Column
Nutcracker Syndrome

Symptoms variable and not specific

- Hematuria
- Left flank or back pain
- Left varicocele
- Pelvic congestion syndrome (PCS)
Treatment

- Conservative (painless hematuria, pubertal pts)
- Endovascular (stenting, treatment of PCS)
- Open Surgery
Endovascular Approach

- Male, 17 yrs
- Gross hematuria and left flank pain
- ANS
Endovascular Approach

- Subclavian access
- Self-expanding 16×30mm Wallstent
- Self-expanding 20×40mm Memotherm stent overlapping the Wallstent

Chiesa R et al. J Endovasc Ther. 2001
Endovascular Approach

- Asymptomatic
- Patency at 36 moths
Open Surgery

- Transperitoneal Approach
- LRV reconstruction,
  LGV transposition
- Open or Laparoscopic

Reed and Gloviczki, JVS 2009; Hartung et al, JVS 2010
Said and Gloviczki, Seminars in Vascular Surgery 2013
LRV Transposition

- Most common
- Technically demanding
- Risk of IVC damage


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LRV Transposition

Patch

Cuff and patch

Cuff

Anterior Nycracker Syndrome

- Female, 34 yrs
- Severe weight loss (25 kg)
- PCS
- Macro hematuria, severe left flank and back pain (from 6 months)
Ultrasound Scan
3D-CT: MPR
Open Surgery (ANS)
Open Surgery (ANS)

LRV

IVC clamping

venotomy

suture

IVC

Ao

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Open Surgery (ANS)
Open Surgery (ANS)
Open Surgery (ANS)

Postoperative day 1
Open Surgery (PNS)

- Female, 17 yrs

- Macro hematuria, severe left flank and back pain (from 2 yrs)

- LRV aberrant and retroartic

Chiesa R. J Vasc Surg. 2011
Anterior LRV Transposition

Chiesa R. J Vasc Surg. 2011
Anterior LRV Transposition

CT scan at 12 months
San Raffaele Experience

93 Cases

71 conservative treatment
22 severe symptoms (20 female)

20 Anterior NS
1 stenting
19 distal trasposition

2 Posterior NS
2 anterior reimplantation

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Results

• No perioperative morbidity
• No related mortality
• 1 reintervention (Stent) → Subocclusion of Gore cuff
• Immediate resolution of symptoms
• Long term patency 91%
Conclusions

- Open repair is safe and effective but technically demanding
- LRV transposition seems to be gold standard
- Endo procedure need to be investigated
- New dedicated stents for LRV are needed
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