The endovascular therapy of the nutcracker syndrome (NCS)

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Introduction

The nutcracker Syndrome (NCS) is described as a mesoaortic compression of the left renal vein between the abdominal aorta and the superior mesenteric artery together with hematuria. If hematuria is not present it is termed nutcracker phenomenon. Looking at it from a transverse plane both SMA and Aorta appear to create a nutcracker crushing the left renal vein imitating a nut.

Pathophysiology

Since the left gonad vein drains via left renal vein pelvic congestion syndrome, left pelvic pain or testicular pain and varicocele can be the result. Direct compression of the splanchnic veins and nerves leads to nausea and vomiting. Increasing pressure of the dura veins leads to head ache and diszziness.

Clinical manifestations

Somatic symptoms

• Lower abdominal or pelvic pain
• Left flank pain
• Dyspareunia, Dysmenorrhea
• Hematuria
• Pelvic congestion syndrome, Priapism
• Head ache
• Aggravating symptoms while exercising

Vegetative symptoms

• Nausea, Vomiting
• Dizziness
• Breathing difficulties
• Diarrhea
• Early feeling of satiety

Depression

Missing diagnosis consistency of complains

Diagnosis

• Duplex ultrasound, LRV ratio
• MRI or CT Scan
• transfemoral phlebography

Therapy

The rare literature describes different approaches. Renal vein Re-implantation or transposition, kidney explantation and re-implantation. Today the treatment of choice is the endovascular treatment using flexible venous stents and high pressure balloons.

Results

2015: n=5, all female, median age 17, primary stenting =3, secondary stenting after PTA of gonad vein = 1, follow-up 6 months: complete disappearance of symptoms

Stenosis of the left renal vein with prestenotic dilatation

Pelvic congestion syndrome in a nutcracker patient

Back flow left gonad vein and suprarenal vein

Pre-ballooning (10mm/40mm high pressure balloons)

Sinus Venous (Fa.Optimed) 14mm/60mm – the stent length should be more than 40mm and extend into the cava at least 1cm in order to avoid later migration

Treated stenosis and no backflow anymore in the gonad vein