

ABSTRACT

Background: “The nutcracker syndrome” is a rare phenomenon occurring in case of the left renal vein compression between the aorta and the superior mesenteric artery leading to the development of phlebohypertension in the left renal vein . Clinical manifestations of “the nutcracker syndrome” are caused by phlebohypertension in the left renal vein.

Methods: 149 patients (129 men and 20 women) with suspected “nutcracker syndrome” (pain in the left lumbar region, hematuria, left sided varicocele in men, and pudendal varicosity in women) underwent the examination. Patients were referred from the western region of Ukraine (a population of about 11 million) from 1999 to 2019 The patients’ age ranged from 14 to 52 years. All patients underwent color Doppler ultrasonography to define the presence of pathological refluxes in the left renal and gonadal veins with the measurement of peak systolic velocity.

Results: . According to color Doppler ultrasonography, different degree of aorta mesenteric compression was confirmed in 81 (55.4%) patients, critical stenosis of the left renal vein was detected in 20 of them. The early postoperative period proceeded without complications in all patients. All patients underwent ultrasound control examination in 3 and 12 months: reconstruction site stenosis was not detected. Assessment of the effectiveness of the left renal vein reimplantation in the remote postoperative period (over 5 years): 8 patients underwent ultrasound control examination of the reconstruction site, restenosis was not detected in 4 patients, hemodynamically insignificant stenosis of the left renal vein (less than 50%) without venous outflow impairment was noted in 4 patients. All of the examined patients indicated disappearance of the pain in the left lumbar region, disappearance of hematuria and proteinuria.

Conclusions: The left renal vein reimplantation in the patients with “the nutcracker syndrome” demonstrates efficacy in the remote postoperative period.

BACKGROUND

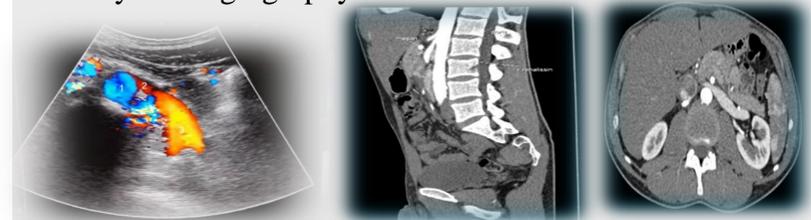
“The nutcracker syndrome” is a rare phenomenon occurring in case of the left renal vein compression between the aorta and the superior mesenteric artery leading to the development of phlebohypertension in the left renal vein . Clinical manifestations of “the nutcracker syndrome” are caused by phlebohypertension in the left renal vein.

PURPOSE

To evaluate long – term outcome (+5 years) after surgery

METHODS

149 patients (129 men and 20 women) with suspected “nutcracker syndrome” (pain in the left lumbar region, hematuria, left sided varicocele in men, and pudendal varicosity in women) underwent the examination. Patients were referred from the western region of Ukraine (a population of about 11 million) from 1999 to 2019 The patients’ age ranged from 14 to 52 years. All patients underwent color Doppler ultrasonography to define the presence of pathological refluxes in the left renal and gonadal veins with the measurement of peak systolic velocity. In case of critical stenosis the diagnosis was aimed by CT angiography.



RESULTS

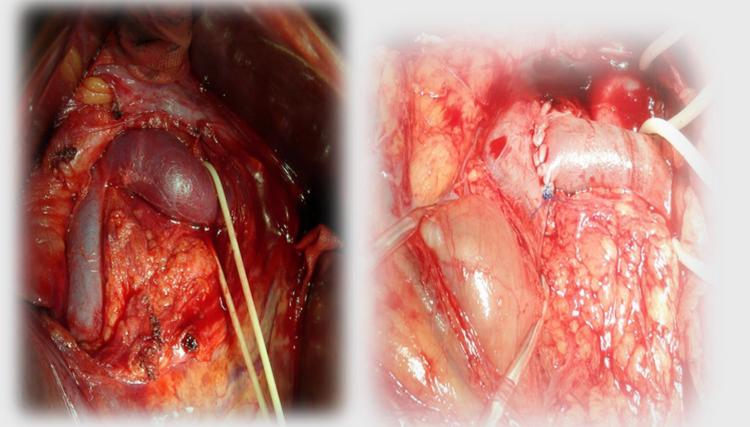
According to ultrasonography, different degree of aorta mesenteric compression was confirmed in 81 (55.4%) patients, critical stenosis of the LRV was detected in 20 of them, 14 patients with critical stenosis underwent the left renal vein reimplantation.. Assessment of the effectiveness of the left renal vein reimplantation in the remote postoperative period (over 5 years):

RESULTS

Surgical indication scale

4 scores	3 scores	2 scores	1 score
Macrohematuria + anemia	Macrohematuria	Pain in the left lumbar region	Microhematuria
Proximal-to-distal LRV PSV ratio ≥5	Proximal-to-distal LRV PSV ratio ≥4	Proximal-to-distal LRV PSV ratio ≥3	Arterial hypertension
	Distal-to-proximal LRV diameter ratio ≥3	Left-sided pudendal varicosity in women	Erectile dysfunction
		Left-sided varicocele in men	Disorder of menstrual function
		Proteinuria	Hemospermia
		Increasing left kidney size ≥1 cm (in all three dimensions)	Blood during coitus

0 - 9	Medical observation
10-14	Surgery is recommended (6 p-ts)
≥15	Surgery is strongly recommended (8 p-ts)



RESULTS

8 patients underwent US control examination of the reconstruction site, restenosis was not detected in 4 patients, hemodynamically insignificant stenosis of the left renal vein (less than 50%) without venous outflow impairment and variation of PSV in LRV (proximal-to-distal LRV PSV ratio ≤ 2) was noted in 4 patients.

All of the examined patients indicated disappearance of the pain in the left lumbar region and hematuria.

CONCLUSION

The left renal vein reimplantation demonstrates positive long-term outcome