

Physician - Venous and Lymphatic System Diseases and Surgery/Endovenous Interventions

[MSB-31]

Treatment of Nutcracker Syndrome: Outcomes with Left Renal Vein Transposition and Stenting

Sabit Sarıkaya, Hakan Hancer, Hasan Karasu, Kaan Kırallı

Koşuyolu Heart Training and Research Hospital, İstanbul, Türkiye

Türk Gogus Kalp Dama 2024;32(Suppl 2):MSB-31

Doi: 10.5606/tgkdc.dergisi.2024.msb-31

E-mail: sabitsarikaya@yahoo.com

Received: September 14, 2024 - Accepted: September 29, 2024

Objective: This study aimed to share our experiences and outcomes with left renal vein (LRV) transposition and endovascular stenting in treating Nutcracker syndrome.

Methods: Data of 20 female Nutcracker syndrome patients (mean age: 24 years) who underwent LRV transposition (n=15) or stenting (n=5) between July 2019 and June 2024 were retrospectively reviewed. Primary endpoints were morbidity and mortality. Secondary endpoints included late complications, patency, freedom from reintervention, and resolution of symptoms.

Results: There were no major complications or mortality after either procedure. The most common signs and symptoms associated with LRV entrapment were left flank pain (100%, n=20), proteinuria (88%, n=15), and hematuria (47%, n=9). After both procedures, classical symptoms resolved in 89.5% (n=17) of patients for left flank pain, 57.8% (n=11) for proteinuria, and 82.3% (n=15) for hematuria. Four patients required reintervention [three after LRV transposition (two for occlusion and one for stenosis) and one after stenting (occlusion)]. The one-year primary patency rate was 87%, and the primary assisted patency rate was 100%. One-year primary patency rates were 91% for the transposition group and 75% for the stent group. The one-year freedom from reintervention was 83%.

Conclusion: Both procedures can be used as primary treatments and have their advantages. This study shows that both methods are safe and effective.

Keywords: Endovascular stent, left renal vein entrapment, left renal vein transposition, Nutcracker syndrome, Nutcracker phenomenon, vascular compression syndrome.

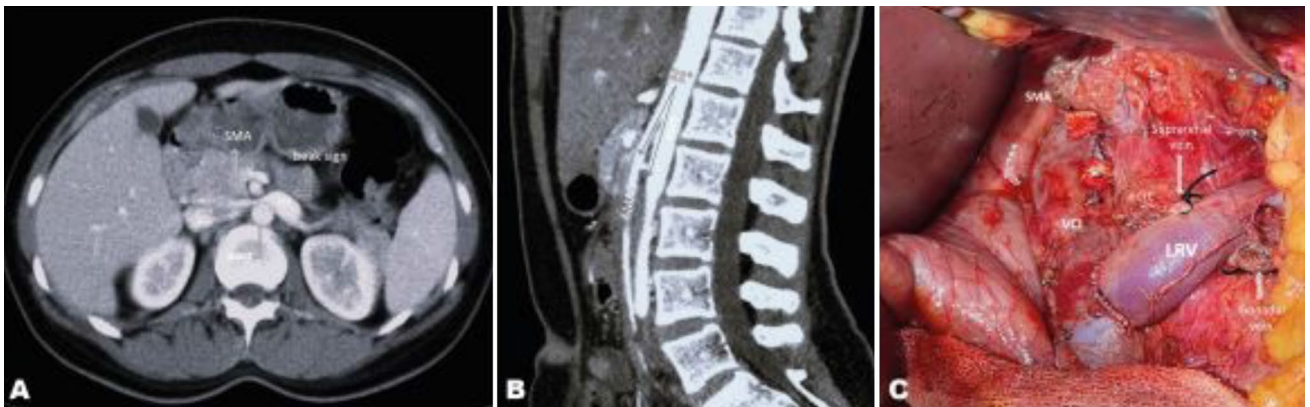


Figure 1. (A) The axial view of the computed tomography (CT) aortogram shows the “beak sign,” an accurate diagnostic indicator of and the result of the compression of the left renal vein (LRV) between the abdominal aorta and the superior mesenteric artery. (B) Computed tomography section displaying nutcracker syndrome. Sagittal CT view of the aortomesenteric region illustrates an angle measuring less than 35° (measured at 21°) between the abdominal aorta and the superior mesenteric artery, meeting the CT criteria for nutcracker syndrome. (C) Intraoperative image of LRV transposition.



Figure 2. (A) Placement of a self-expandable venous stent (Abre Venous, Medtronic). (B) Postdilation of the LRV stent. (C) Venography of the LRV after stent placement.

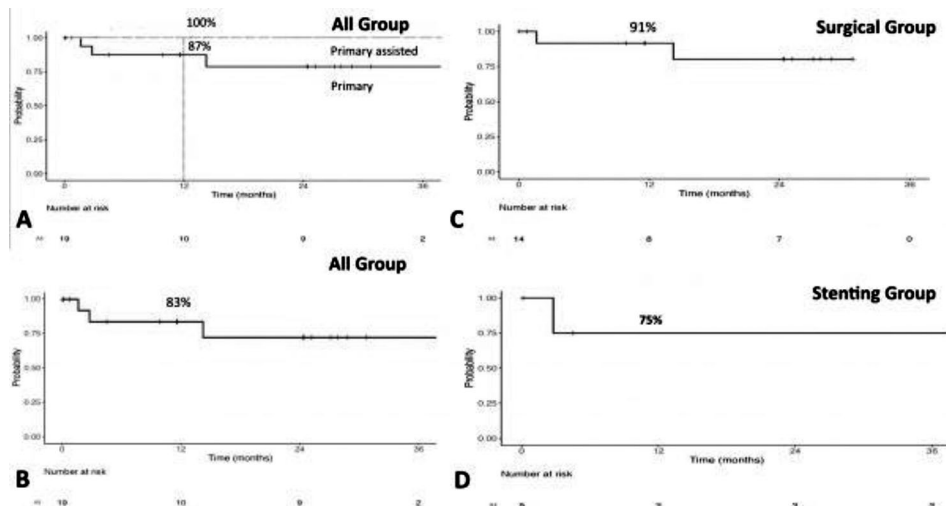


Figure 3. (A) The primary patency and primary assisted patency for 19 patients at 12 months were 87.5% and 100%, respectively. (B) Freedom from reintervention of the transposed left renal vein for 19 patients at 12 months was 83%. (C) The primary patency rate for the transposition group at 12 months was 91.7%. D- The primary patency rate for the stent group at 12 months was 75%.

References

- Avgerinos ED, McEnaney R, Chaer RA. Surgical and endovascular interventions for nutcracker syndrome. *Semin Vasc Surg* 2013;26:170-7. doi: 10.1053/j.semvassurg.2014.06.014.
- Alayut D, Bayram M, Soylu A, Cakmakci H, Turkmen M, Kavukcu S. Clinical course of children with nutcracker syndrome. *Urology* 2013;82:686-90. doi: 10.1016/j.urology.2013.03.048.
- Ananthan K, Onida S, Davies AH. Nutcracker syndrome: An update on current diagnostic criteria and management guidelines. *Eur J Vasc Endovasc Surg* 2017;53:886-94. doi: 10.1016/j.ejvs.2017.02.015.
- Venkatachalam S, Bumpus K, Kapadia SR, Gray B, Lyden S, Shishehbor MH. The nutcracker syndrome. *Ann Vasc Surg* 2011;25:1154-64. doi: 10.1016/j.avsg.2011.01.002.
- Shin JI, Lee JS. Nutcracker phenomenon or nutcracker syndrome? *Nephrol Dial Transplant* 2005;20:2015. doi: 10.1093/ndt/gfi078.
- Kurklinsky AK, Rooke TW. Nutcracker phenomenon and nutcracker syndrome. *Mayo Clin Proc* 2010;85:552-9. doi: 10.4065/mcp.2009.0586.
- Berthelot JM, Douane F, Maugars Y, Frampas E. Nutcracker syndrome: A rare cause of left flank pain that can also manifest as unexplained pelvic pain. *Joint Bone Spine* 2017;84:557-62. doi: 10.1016/j.jbspin.2016.10.006.
- Reed NR, Kalra M, Bower TC, Vrtiska TJ, Ricotta JJ 2nd, Gloviczki P. Left renal vein transposition for nutcracker syndrome. *J Vasc Surg* 2009;49:386-93. doi: 10.1016/j.jvs.2008.09.051.