

Case Report**Recurrent Varicocele Revealing Coexisting Renal Nutcracker and Superior Mesenteric Artery Syndromes: A Case Report**

Asad Ahmad Qureshi¹ and Zoha Maryam²

1. Department of Radiology, Shahida Islam Medical College, Lodhran, Pakistan
2. Department of Radiology, Bahawal Victoria Hospital, Bahawalpur, Pakistan

Abstract: Renal nutcracker syndrome (RNCS) is seen when the renal vein is compressed or trapped between the superior mesenteric artery (SMA) and the aorta. Typically, it presents as pain in the left flank and pelvis, along with hematuria, and less commonly as varicocele. Conversely, RNCS is a frequent finding in patients presenting with a varicocele. Superior mesenteric artery (SMA) syndrome is a result of compression of the third part of the duodenum as it passes between the superior mesenteric artery and the aorta. It is one of the rare causes of intestinal obstruction. The coexistence of SMA syndrome and RNCS is uncommon.

A 22-year-old male presented with a long-standing history of abdominal pain, weight loss, and diarrhea for which he had been treated as irritable bowel syndrome. Additionally, the patient underwent surgery for a varicocele a few years ago and now presented with recurrence. Initial laboratory investigations were unremarkable. Scrotal ultrasound scan demonstrated left-sided varicocele. Contrast-enhanced CT of the abdomen revealed findings consistent with RNCS & SMA syndrome. The patient was planned for a second surgery for varicocele and was managed conservatively for RNCS & SMA syndrome.

Keywords: Nutcracker syndrome; Nutcracker phenomenon; Superior mesenteric artery syndrome; Varicocele; Aortomesenteric angle

How to cite: Qureshi AA, Maryam Z. Recurrent Varicocele Revealing Coexisting Renal Nutcracker and Superior Mesenteric Artery Syndromes: A Case Report. J Univ Physicians Surg Pak (JUPSP). 2026; 10–13.

Corresponding Author: Zoha Maryam: Email: zohaaaaa44@gmail.com

Introduction

Renal nutcracker syndrome (RNCS) is a venous compressive disease caused by the compression of the left renal vein while it travels between the aorta and superior mesenteric artery (SMA).¹ It usually manifests as flank pain, hematuria, & occasionally as recurrent varicocele.² Diagnosis is mainly based on clinical features and supporting contrast imaging. The treatment of RNCS is guided by the patient's symptoms and the severity of left renal vein compression. A wide range of therapeutic approaches exists, from routine monitoring to surgical removal of the kidney, depending on how severe the symptoms are and the chances of improvement.³

Superior mesenteric artery (SMA) syndrome results from duodenal constriction by the SMA. Typical symptoms include persistent nausea after meals, vomiting, loss of appetite, weight loss, acid reflux, and pain in the upper abdomen. Investigations crucial for diagnosis are

gastroscopy with biopsy and contrast imaging. Management of SMA syndrome ranges from conservative strategies to surgical procedures.³

Diagnosis and management of concurrent RNCS and SMA syndrome are often delayed owing to the rare coexistence and a broad and vague range of signs and symptoms.⁴ This report presents a unique case of an adult male with a recurrent varicocele, which, on imaging, proved to be due to underlying RNCS, and also simultaneously existing SMA syndrome.

Case Presentation

A 22-year-old male presented with recurrent varicocele for which he was operated on previously. The patient also reported abdominal pain, diarrhea, and weight loss for quite some time, for which he has been treated as having irritable bowel syndrome. There was no associated history of trauma or being involved in strenuous physical activity. Physical examination

revealed stable vital signs along with a left-sided varicocele. Laboratory investigations were unremarkable.

Urinalysis showed no hematuria. Repeat scrotal ultrasound scan demonstrated left-sided varicocele with enlarged tortuous pampiniform plexus veins with a maximum diameter of 3.4 mm. For further evaluation, a contrast-enhanced CT abdomen and pelvis was performed.

Imaging revealed a reduced aortomesenteric angle of about 14.3° (Figure 1). There was compression of the left renal vein with a dilated proximal end (10.6 mm) and a relatively smaller diameter distally (6.4 mm) (Figure 2). The left gonadal vein was also dilated. No renal masses or other vascular anomalies were evident. Additionally, there was dilatation of the stomach and proximal duodenum, including the first & second parts (Figure 3). The CT scan also showed a decreased aorto-SMA distance measuring 3.9 mm (Figure 4). A diagnosis of concurrent SMA syndrome and RNCS was made.

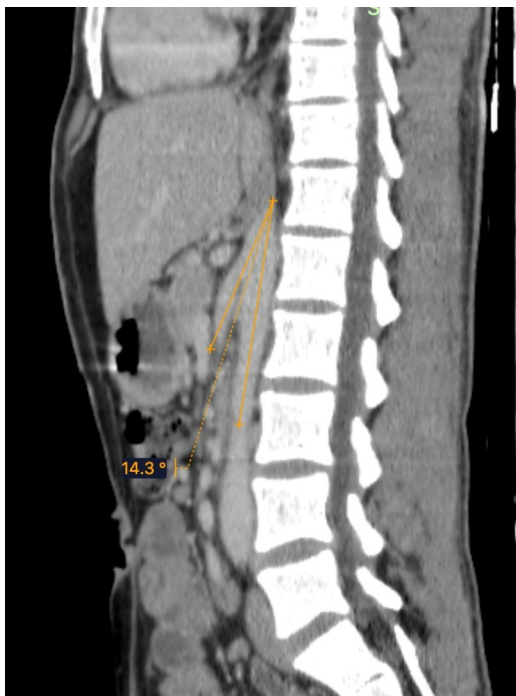


Figure 1: Sagittal CT image showing a reduced aortomesenteric angle measuring 14.3° .

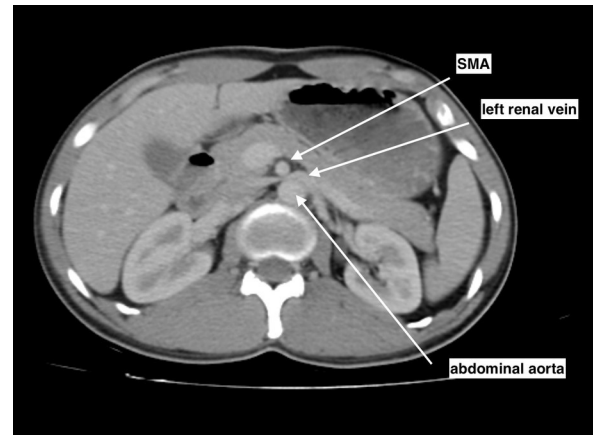


Figure 2: Axial CT image showing compression of the left renal vein.

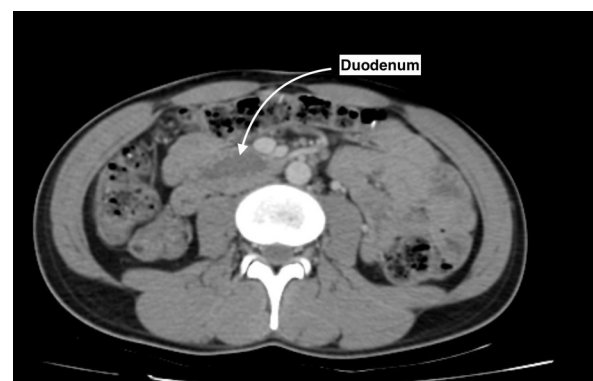


Figure 3: Axial CT image showing dilatation of the second part of the duodenum due to compression of third part between the superior mesenteric artery and the aorta.

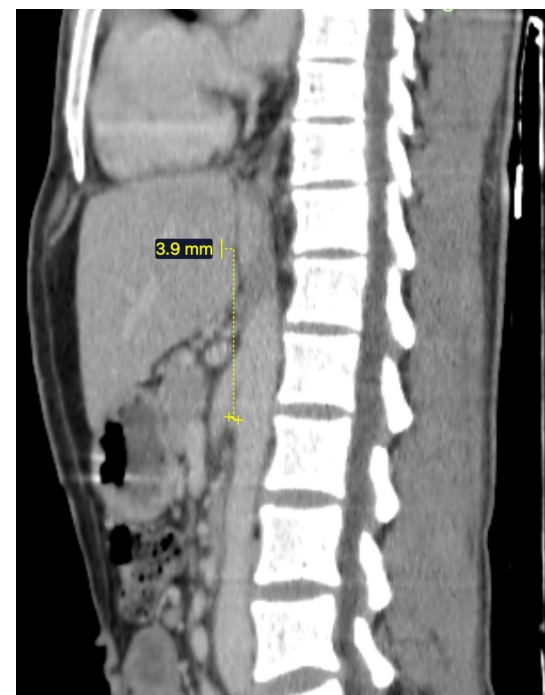


Figure 4: Sagittal CT image showing decreased aortomesenteric distance measuring 3.9 mm (normal 10–28 mm).

The patient was then referred to surgery for treatment of varicocele, while the RNCS & SMA syndrome was managed conservatively. Conservative management included a high-calorie diet for weight gain, oral multivitamin tablet once daily, and symptomatic treatment using anticholinergics for diarrhea (Tablet Chlordiazepoxide-Clidinium 2.5 mg twice daily), and proton pump inhibitors (Capsule Esomeprazole 40 mg once daily). At 6-month follow-up, he had improved significantly, reporting a marked improvement in his symptoms and relief of diarrhea along with an 8-kg weight gain.

Discussion

A recurrent varicocele should prompt investigations for underlying secondary causes. This case highlights a unique association between varicocele and venous compression syndromes, particularly RNCS and SMA syndrome.

Renal nutcracker syndrome presents with a wide range of signs and symptoms, including hematuria (69.5%), flank pain (48.4%), weight loss, or pelvic pain (23.1%). Presentation as a varicocele is less common (15%).¹ RNCS is diagnosed on contrast-enhanced CT. Diagnostic criteria include abrupt narrowing of the left renal vein between SMA and aorta, with the proximal portion of the vein being dilated, a hilar-to-aortomesenteric diameter ratio of greater than 4.9, an aortomesenteric angle less than 41°, and more than 50% reduction in caliber of the left renal vein at the level of compression with resultant beak sign.²

Superior mesenteric artery syndrome results from extrinsic compression of the third portion of the duodenum by the SMA. Typical clinical presentation includes a history of postprandial abdominal pain, nausea, and vomiting. Imaging typically reveals a compressed duodenum between the SMA and aorta, along with a marked reduction in the aortomesenteric distance (2–8 mm vs normal 10–34 mm) and a decreased aortomesenteric angle (6°–22° vs normal 38°–56°).³

The concurrent presentation of RNCS and SMA syndrome is infrequently reported, and diagnosis remains a significant challenge. This can be explained by the anatomical narrowing of the aortomesenteric space, simultaneously causing compression of both the left renal vein and the third part of the duodenum.⁴

Initial management of both conditions emphasizes conservative strategies.⁵ In SMA syndrome, the primary focus is on nutritional rehabilitation through weight gain, supported by gastric and duodenal decompression to alleviate obstructive symptoms, fluid resuscitation, and correction of electrolyte imbalance. Nutritional support is typically provided via enteral jejunal feeding, total parenteral nutrition (TPN), or a combination of both modalities. Surgical intervention is reserved for refractory cases and may include procedures such as gastrojejunostomy, duodenojejunostomy, or Strong's procedure. In RNCS, invasive management options, including left renal vein stenting, may be employed to relieve venous outflow obstruction.⁶

This case highlights the importance of evaluating secondary etiologies, such as vascular compression syndromes, in patients with recurrent varicocele. Although the coexistence of RNCS and SMA syndrome is uncommon, it emphasizes the importance of maintaining a high level of clinical suspicion, particularly when symptoms are atypical or resistant to conventional therapy. Doppler ultrasound and cross-sectional angiography are pivotal for accurately detecting anatomical compressions. Prompt diagnosis and timely intervention are crucial to prevent long-term complications and enhance clinical outcomes. Clinicians should remain vigilant for concurrent vascular compression syndromes when assessing patients with persistent urogenital or gastrointestinal complaints.

Conclusion

Renal nutcracker syndrome, along with superior mesenteric artery syndrome, may rarely present together. Persistent urogenital and gastrointestinal complaints should raise suspicion. Awareness of this coexistence is essential for early diagnosis and treatment of the patient.

Declarations

Competing interest: The authors declared no conflict of interest.

Authors' Contribution: All the authors contributed to the design, drafting, and critical revision of the manuscript. All authors approved the final version of the manuscript to be published.

References

1. Fong JKK, Poh ACC, Tan AGS, Taneja R. Imaging findings and clinical features of abdominal vascular

- compression syndromes. *AJR Am J Roentgenol*. 2014;203(1):29–36. doi:10.2214/AJR.13.11598.
2. Lamba R, Tanner DT, Sekhon S, McGahan JP, Corwin MT, Lall CG. Multidetector CT of vascular compression syndromes in the abdomen and pelvis. *Radiographics*. 2014;34(1):93–115. doi: 10.1148/rg.341125010.
 3. Khan H, Al-Jabbari E, Shroff N, Barghash M, Shestopalov A, Bhargava P. Coexistence of superior mesenteric artery syndrome and nutcracker phenomenon. *Radiol Case Rep*. 2022;17(6):1927–1930. doi: 10.1016/j.radcr.2022.03.063.
 4. Almunifi A, Al-Dhayan AZ, Alanazi M, Ababtain OA. Concurrent encounter of superior mesenteric artery syndrome and nutcracker syndrome in a young female patient: A case report and literature review. *Cureus*. 2024;16(8):e66002. doi:10.7759/cureus.66002.
 5. Boroomand-Saboor M, Moradi H. Double trouble: A case report of concurrent superior mesenteric artery syndrome and nutcracker syndrome in a previously healthy young adult. *Int J Surg Case Rep*. 2025;127:110968. doi:10.1016/j.ijscr.2025.110968.
 6. Khaled A, Chaouche I, El Bouardi N, Alami B, Lamrani MYA, Boubbou M, et al. Concurrent Superior Mesenteric Artery and Nutcracker Syndromes: A Case Report. *Cureus*. 2025;17(7):e88906. doi:10.7759/cureus.88906.