

Posterior nutcracker syndrome: caused by pelvic pain

Posterior nutcracker sendromu: Pelvis ağrısının nedeni

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Posterior nutcracker syndrome is one of the abdominal venous entrapments caused by compression of the left renal vein between the vertebral column and the abdominal aorta. In this article, we report our first experience in a patient with posterior nutcracker syndrome who was referred to our clinic with pelvic congestion symptoms. A 39-year-old female patient was admitted to our clinic with the complaint of pelvic pain especially on the left side. Abdominal computed tomography angiography demonstrated vascular congestion appearance extending from pelvis at retroperitoneal space on the left side. End-to-side gonadocaval bypass was performed to the patient. Postoperative abdominopelvic tomography revealed that perirenal and retroperitoneal hematoma resolved completely. All of her previous complaints disappeared in the second postoperative months. We believe that gonadocaval bypass is an open surgical procedure which can be safely performed for selected patients.

Keywords: Gonadocaval bypass; pelvic pain; posterior nutcracker syndrome.

Nutcracker syndrome (NCS) is one of the abdominal venous entrapments caused by the compression of the left renal vein between the vertebral column and the abdominal aorta. However, occasionally, a retroaortic left renal vein is compressed between the aorta and the vertebral body (posterior NCS). When this happens, the renal vein distal to the compression is dilated, and renal venous flow can be diverted toward the pelvis through an incompetent, refluxing, left ovarian or spermatic vein in addition to the drainage through the retroperitoneal venous collaterals.^[1,2]

Posterior nutcracker sendromu, sol renal venin vertebral kolon ve abdominal aort arasında sıkışması sonucunda meydana gelen abdominal venöz tuzaklanmalardan biridir. Bu yazıda, pelvis sıkışması belirtileri ile kliniğimize sevk edilen posterior nutcracker sendromlu bir hastadaki ilk deneyimimiz sunuldu. Otuz dokuz yaşındaki kadın hasta, özellikle sol tarafı tutan pelvis ağrısı yakınmasıyla kliniğimize başvurdu. Abdominal bilgisayarlı tomografi anjiyografide sol tarafta retroperitoneal boşlukta pelvise doğru uzanan damar tıkanıklığı görünümü izlendi. Hastaya uç-yan gonadokaval baypas yapıldı. Ameliyat sonrası çekilen abdominopelvis tomografisinde perirenal ve retroperitoneal hematoma tamamen iyileştiği görüldü. Hastanın önceki yakınmalarının tümü ameliyattan sonra ikinci ayda sona erdi. Gonadokaval baypasın seçilmiş hastalarda güvenli bir şekilde yapılabilecek açık cerrahi işlem olduğu görüşüyoruz.

Anahtar sözcükler: Gonadokaval baypas; pelvis ağrısı; posterior nutcracker sendromu.

In this report, we present our first experience involving a patient with symptoms of pelvic congestion who was diagnosed with posterior NCS in which the left renal vein was trapped between the aorta and vertebral column (Figure 1).

CASE REPORT

A 39-year-old women was admitted to our clinic with pelvic pain, especially on the left side. The patient stated that she had visited doctors in several clinics within the last two years and had been intermittently



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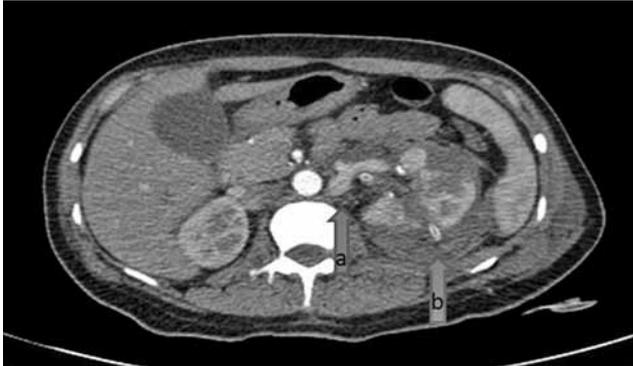


Figure 1. (a) Retroaortic left renal vein. (b) Vascular congestion appearance.

given treatments for a urinary tract infection (UTI) and kidney stones as a result of some routine tests. Her proteinuria level was 201.67 mg/day (normal value is <140 mg/day) during a 24-hour urine analysis. In addition, minimal fluid in the pelvis, right-sided pelvicalyceal dilatation [ureteropelvic (UP) obstruction], and right nephrolithiasis were found during an abdominopelvic tomographic examination performed after the routine tests. Furthermore, vascular congestion appearance extending from the pelvis at the retroperitoneal space on the left side, free fluid in the pelvis, dilated gonadal veins, and dilated tortuous vascular structures in the left half of the pelvis (pelvic congestion) were also observed (Figure 1). Based on these results, single-sided selective renal angiography was performed in order to elucidate the etiology completely. It was observed that the renal vein was patent but that it continued between the abdominal aorta and vertebra by narrowing severely. Moreover, the left gonadal vein was severely dilated from the point where it emptied into the renal vein until it reached the pelvis. The patient was then diagnosed with posterior NCS. The dilated tortuous veins compatible with pelvic congestion were detected in the pelvic

color Doppler of the patient, so we decided to perform a gonadocaval bypass. Initially the gonadal vein bilaterally drained, and retrograde and antegrade flow was seen. Then the end-to-side gonadocaval bypass was performed after obtaining the patient's consent (Figure 2). During the postoperative period, renal function tests and renal color Doppler examinations were intermittently performed, and no congestion at the gonadal region was detected on the Doppler examination. The gonadocaval anastomosis and native renal vein were found to be patent, and the patient was discharged from the hospital on the postoperative fifth day. During a color Doppler examination of the pelvis, we noted that the symptoms of congestion had gradually decreased and that the patient no longer had any complaints. After the operation, abdominopelvic tomography was performed, and the perirenal and retroperitoneal hematoma had resolved completely (Figure 3). Furthermore, the patient stated that all of her previous complaints had disappeared at the second postoperative month.

DISCUSSION

A differential diagnosis of pelvic pain, which is commonly observed in both men and women, is difficult for general surgeons to evaluate, and it is especially challenging for gynecologists to determine the source of the problem in women. However, posterior NCS seems to be a clinical presentation that should be considered in the differential diagnosis of this symptom.^[3] Our patient's most serious complaint was pain in the pelvic region, and various attempts had failed to make an adequate diagnosis.

The vascular stenting option is not a preferred treatment option because of the increased likelihood of injury, especially due to the compression of the renal vein between the aorta and vertebra. Information about all of the treatment options was given to the



Figure 2. Gonadocaval anastomosis.

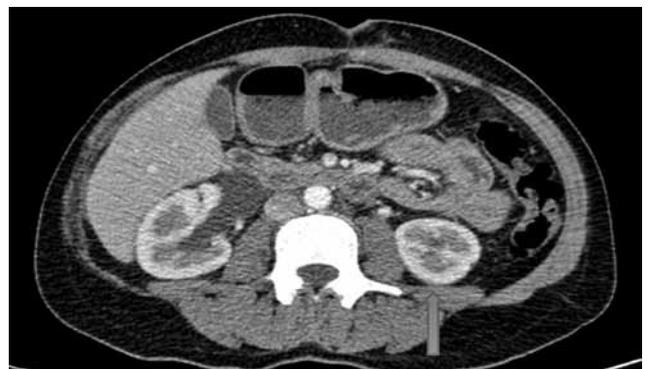


Figure 3. Resolved retroperitoneal hematoma.

patient, and he consented to the gonadocaval bypass. This procedure serves both as an outflow for the obstruction of the gonadal system and as an accessory drainage pathway for the renal vein. For side-to-side anastomosis, gonadocaval bypass grafting can be done using the H graft technique.^[6] However, we preferred end-to side anastomosis without the graft in order to prevent thrombotic problems associated with prosthetic materials compared to native vessels. The reason for the pelvic pain in our patient was congestion caused by the reverse current gradient from the left renal vein to the gonadal vein. Sofikitis et al.^[6] studied autopsies performed on 49 male cadavers along with the entire course of the left testicular vein and found an absence of valves at the lumbar level in 37% of the cases.^[6] When dilatation of the gonadal vein occurs, the patient's valve system cannot function.

There are many opinions regarding the management of NCS in the literature, but few cases of posterior NCS have been reported.^[3] The incidence of a retroaortic left renal vein has been reported as being between 1 and 3% in persons with this condition, and most of these were asymptomatic.^[5] Since spontaneous remission may occur at patients of advanced age, a conservative approach is usually preferable, especially for those patients whose diagnoses were made during the pubertal period.^[5] Therefore, conditions such as the patient's age, severity of symptoms, presence of associated problems, and difficulties associated with conservative follow-up should be considered when deciding on the appropriate choice of treatment. Other causes of pelvic pain, such as hematuria and proteinuria, should also be ruled out, and a diagnosis of NCS should only be made after excluding all known causes of hematuria. The diagnostic workup depends on many procedures, including computed tomography and magnetic resonance angiography. Afterwards, the diagnosis can then be established by selective left renal vein and vena cava venography as well as venous pressure measurements in the left renal vein and vena cava.^[3]

In a study by Scultetus et al.,^[5] three patients with pelvic congestion symptoms underwent a gonadocaval bypass as their preferred method of treatment, and

a decline in the renocaval gradient and a significant improvement in their symptoms were observed.

In conclusion, posterior NCS is an infrequent clinical picture that should be considered in the etiology of pelvic pain and can manifest with symptoms of pelvic congestion, hematuria, and proteinuria. Endovascular and open surgical procedures that can reduce the elevated pressure gradient in the left renal vein have been evaluated as a treatment alternative in the literature,^[4] especially in women of reproductive age, and an appropriate treatment modality should be rigorously chosen for appropriate cases with this pathology. In addition, it is important that the selected treatment method improve the patient's symptoms by minimizing the postoperative complication risks. Our experience with this case shows that a gonadocaval bypass is an open surgical procedure that can be performed successfully on selected patients.

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REFERENCES

1. Said SM, Gloviczki P, Kalra M, Oderich GS, Duncan AA, D Fleming M, et al. Renal nutcracker syndrome: surgical options. *Semin Vasc Surg* 2013;26:35-42.
2. Kuř E, Barutca H, Kanyılmaz M, Sargın M, Şahin S. Nutcracker syndrome. *Turk Gogus Kalp Dama* 2013;21:146-50.
3. Ali-El-Dein B, Osman Y, Shehab El-Din AB, El-Diasty T, Mansour O, Ghoneim MA. Anterior and posterior nutcracker syndrome: a report on 11 cases. *Transplant Proc* 2003;35:851-3.
4. Ahmed K, Sampath R, Khan MS. Current trends in the diagnosis and management of renal nutcracker syndrome: a review. *Eur J Vasc Endovasc Surg* 2006;31:410-6.
5. Scultetus AH, Villavicencio JL, Gillespie DL. The nutcracker syndrome: its role in the pelvic venous disorders. *J Vasc Surg* 2001;34:812-9.
6. Sofikitis N, Dritsas K, Miyagawa I, Koutselinis A. Anatomical characteristics of the left testicular venous system in man. *Arch Androl* 1993;30:79-85.