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Case Report / Olgu Sunumu

Spontaneous severe retroperitoneal hemorrhage with concomitant renal pelvis rupture during the course of COVID-19 infection: a case report

COVID-19 enfeksiyonu geçiren hastada böbrek pelvis rüpürünün eşlik ettiği spontan ciddi retroperitoneal kanama: olgu sunumu

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Özet

Spontan renal pelvis rüptürü nadir rastlanılan ürolojik olay olup idrarın extravazasyonuna neden olan bir durumdur. Sıklıkla üriner sistemde gelişen obstrüksiyonlara sekonder olarak pelvis içi basıncın artması sonucu gelişir. Spontan retroperitoneal hematom da yine benzer şekilde travma veya altta yatan bir patoloji olmaksızın ortaya çıkan retroperitoneal kanamalardır. Bu çalışmada 63 yaşında antikoagulan tedavisi alan Covid-19 tanılı bir bayan hastada, retroperitonda spontan olarak oluşan hematom ve hematomun basısına sekonder olarak gelişen spontan renal pelvis rüptürü olgusunu sunuyoruz. Bu olgu ışığında Covid-19 infeksiyonuna bağlı yaygın endotel hücre hasarının, spontan ciddi retroperitenal kanamaya ve eşlik eden renal pelvis rüptürüne neden olabileceğini vurgulamak istiyoruz. Nadir görülen durumlar olan spontan renal pelvis rüptürü ve spontan retroperitoneal kanamanın aynı anda aynı hastada görüldüğü literatürde ilk kez bildirilmektedir.

Anahtar Kelimeler: antikoagulan tedavi, COVID-19, renal pelvis rüptürü, retroperitoneal hematom, üriner obstrüksiyon

Abstract

Spontaneous rupture of the renal pelvis is a rarely encountered urological event that causes extravasation of urine. It often occurs as a result of increased intrapelvic pressure secondary to obstructions developed in the urinary system. Similarly spontaneous retroperitoneal hematoma is retroperitoneal hemorrhage that occurs without trauma or an underlying pathology. In this study, we present a case of spontaneous rupture of the renal pelvis that developed secondary to compression of the hematoma that occurred spontaneously in the retroperitoneum in a 63-year-old female patient who received anticoagulant therapy with the diagnosis of Covid-19 infection. In the light of this case, we would like to emphasize that widespread endothelial cell damage associated with Covid-19 infection may cause spontaneous severe retroperitenal bleeding and accompanying renal pelvis rupture. In which both the rarely encountered spontaneous rupture of the renal pelvis and spontaneous retroperitoneal bleeding are seen simultaneously in the same patient, is reporting for the first time in the literature.

Keywords: anticoagulant treatment, COVID-19, renal pelvis rupture, retroperitoneal hematoma, urinary obstruction

INTRODUCTION

Spontaneous or atraumatic renal pelvis rupture is an extremely rare condition. It usually develops after a pathological condition that leads to obstruction in the urinary system (1). It has been reported that the renal pelvis, which is very poorly supported by the parenchyma of the kidney, cannot withstand the increasing pressure after the emerging obstruction and ruptures (2). Urine extravasation occurs following development of rupture, and complaints such as flank pain, abdominal pain, nausea and vomiting become manifest as in the case with urinary stone disease (3). Similarly, spontaneous retroperitoneal hematoma is also a rare event and it is a retroperitoneal bleeding that occurs without trauma, urinary stone disease, or an underlying pathology. In this study, we report a case of spontaneous rupture of the renal pelvis that occurred secondary to compression of the hematoma developed in the retroperitoneum in a female patient diagnosed with Covid-19 infection who received anticoagulant therapy. As far as we know, this case, in which both the rarely encountered spontaneous rupture of the renal pelvis and spontaneous retroperitoneal bleeding are seen simultaneously in the same patient, is reported for the first time in the literature.

CASE REPORT

A 63-year-old female patient applied to our emergency department with complaints of weakness, high fever, cough and shortness of breath. It was learned that the patient, who had no history of systemic disease, had a positive Covid-19 test performed in another center 3 days ago. Chest Computed Tomography (CT) of the patient revealed findings compatible with acute viral pneumonia. Then the treatment of the patient was initiated with ceftriaxone [(2 x 1 gram (g) / intravenous (iv)], hydroxychloroquine [(2 x 200 milligram (mg)], ascorbic acid (2 x 3 g iv) and enoxaparin sodium [(2 x 6000 international units (IU) / 0,6 milliliter (ml)]. Four days after her hospitalization, the patient developed colicky pain felt on the left flank and lower abdominal quadrants. Urology consultation was requested because the patient with an urethral catheter had no urine output for the last 3 hours and swelling in the suprapubic region was detected, considering that the patient developed urinary retention. On physical examination, costovertebral angle tenderness on the left side and a mass localized slightly to the left in the suprapubic area were palpated. Ultrasonography revealed the presence of an empty bladder and a large cystic appearance adjacent to the left lateral posterior wall of the bladder. Mild hydroureteronephrosis was found on the left side of the patient's CT, which was taken without contrast agent administration (Figure 1A). No contrast agent leakage was detected in the perirenal or periureteral area in the CT taken immediately after the patient was administered iv contrast agent (Figure 1B). The absence of contrast medium leakage may be due to CT taken immediately after administration of the contrast agent. However no fluid collection was observed in the perirenal area in the same film. In order to monitor the ureters, CT scan was performed again 15 minutes after contrast agent administration. Significant extravasation of contrast material and fluid collection were detected in the perirenal and periureteral area (Figure 1C). On the lower abdomen tomography, a cystic mass consistent with a hematoma of approximately 13 cm, originating from the abdominal anterolateral wall muscles, extending to the left posterolateral side of the bladder and pushing the bladder towards right anterolateral direction was detected (Figure 2). Urinary extravasation and the bladder pushed by the hematoma were clearly detected in three-dimensional CT (Figure 3A). The patient underwent emergency operation due to a decrease in her hematocrit values and deterioration in her hemodynamic parameters despite blood transfusion. The hematoma was evacuated by controlling the bleeding focus localized on the lateral aspect of the rectus muscle. The patient was treated conservatively for renal pelvis rupture. In the control tomography taken on the 3rd postoperative day of the patient, who was followed up with a catheter, the fluid around the renal pelvis and ureter was absorbed. Extravasation of contrast agent was not detected and the bladder was found to return to its normal position (Figure 3B). The patient was discharged after completion of her Covid-19 treatment. Radiological investigations did not reveal the presence of a urinary stone. The patient had no history of urinary stone disease and renal mass.

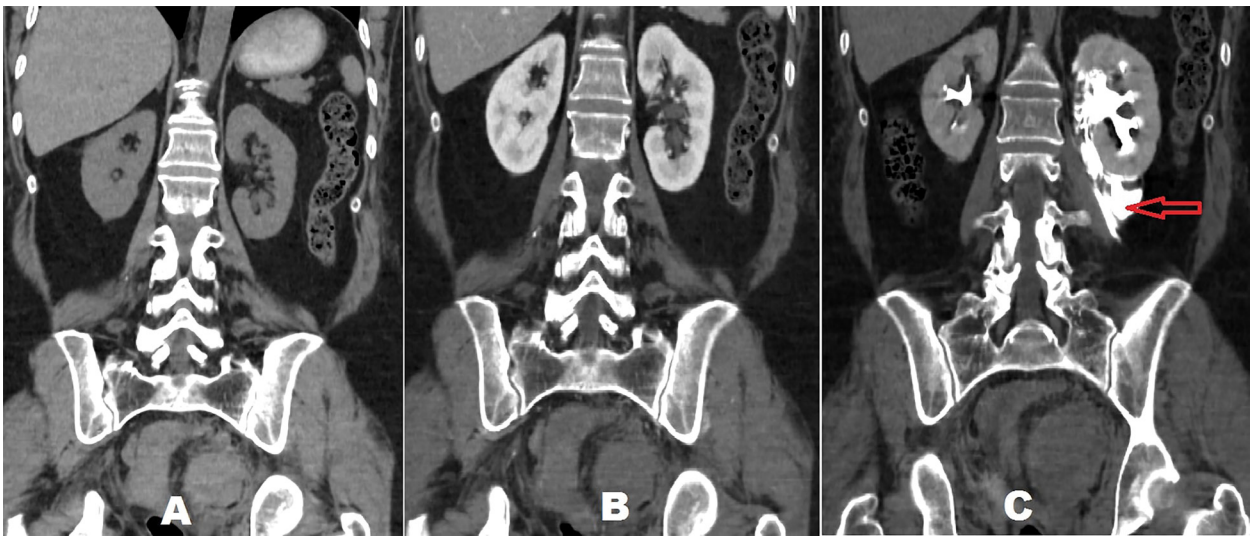


Figure 1.A: Computed Tomography (CT) image taken before administrationn of the opaque material: Any fluid collection is not seen in the perirenal area
B: CT image obtained after administration of contrast material. Still, any fluid collection and extravasation of contrast material is not seen.
C: CT image taken 2 hours after administration of contrast material: Intense contrast material extravasation is seen (red arrow).

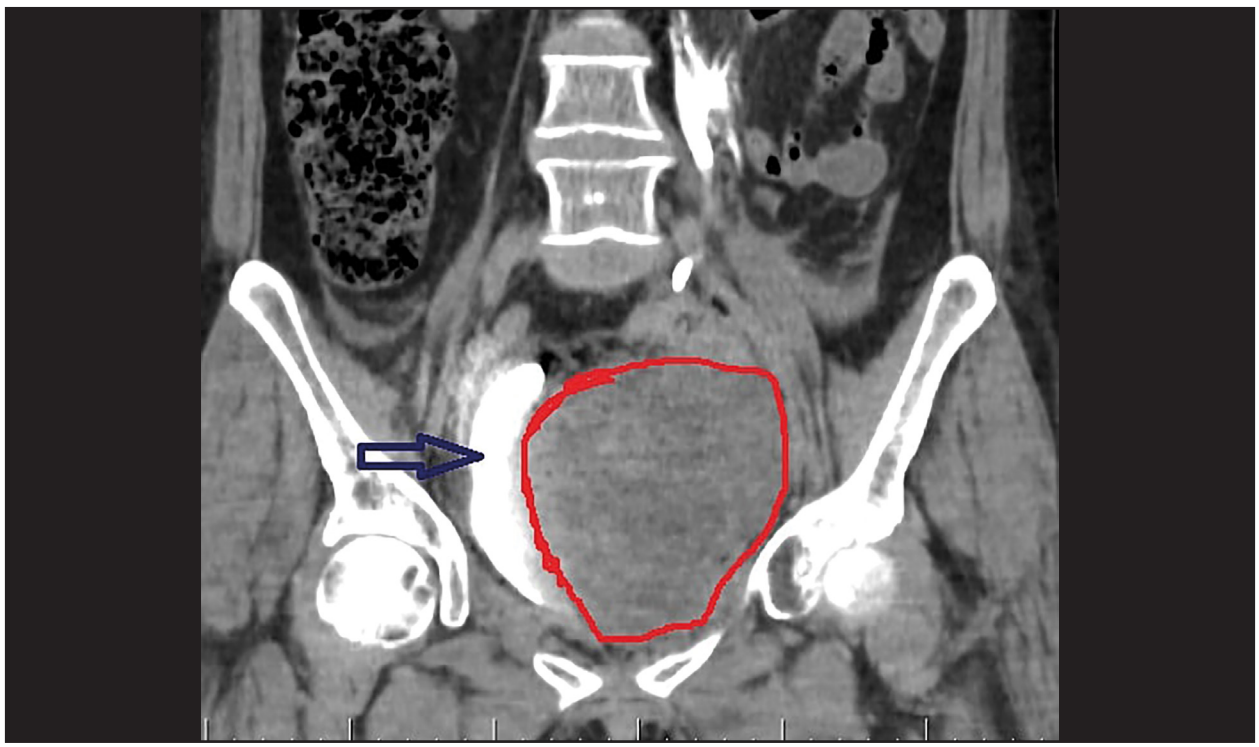


Figure 2: Computed Tomography image of retroperitoneal hematoma (area surrounded by red lines) pushing the bladder (blue arrow) to the right

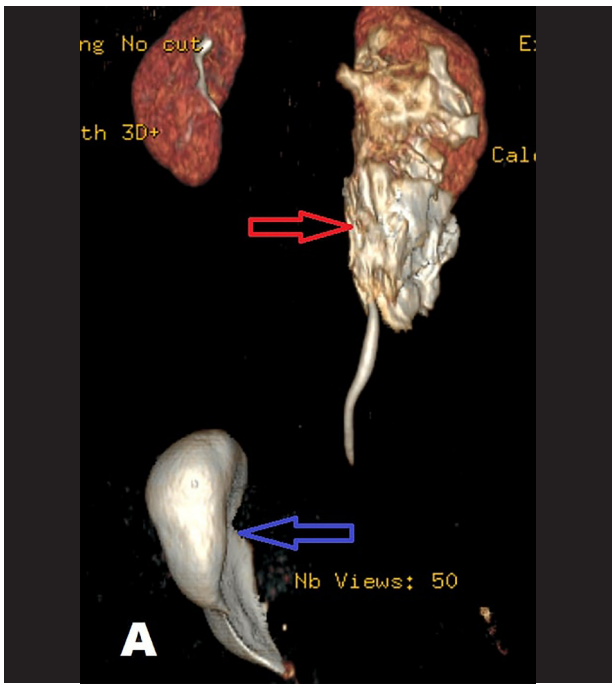
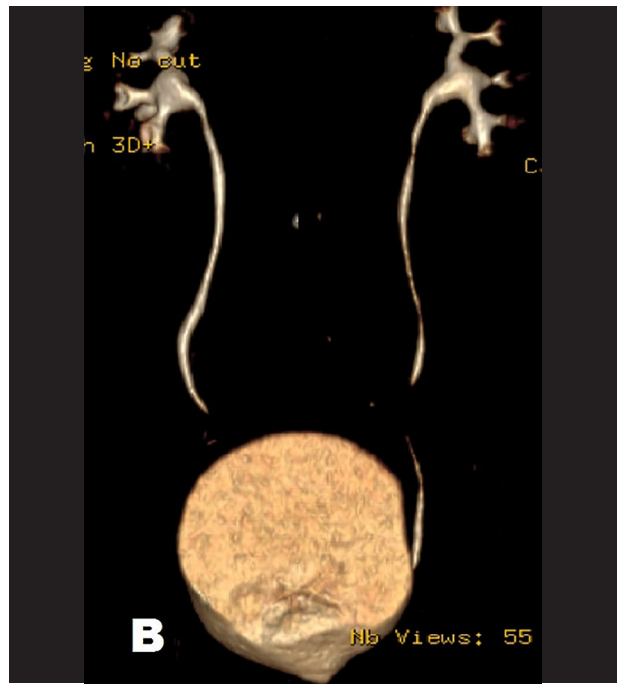


Figure 3.A: Urine extravasation (red arrow) due to left renal pelvis rupture is seen. The bladder is pushed to the right (blue arrow) due to compression of the hematoma.



B: Computed Tomography image taken on the 3rd postoperative day after the evacuation of the hematoma: Urine extravasation is not observed and the bladder is in its normal position.

DISCUSSION

Spontaneous rupture of the renal pelvis with urine extravasation is a rare condition and usually occurs in cases of urinary obstruction due to the presence of stones and tumors. Also, extrinsic factors such as pregnancy, hematoma or tumors of adjacent organs may play a role in the development of renal pelvis rupture by causing obstruction.

Extravasation of urine is defined as the escape of the urine from at any level of the urinary collecting system extending from calyces to the urethra. This condition is defined spontaneously if it has occurred due to etiologic factors other than trauma, iatrogenic manipulation, previous surgeries or the presence of degenerative kidney disease (4). It has been reported that rupture is often seen in fornices with thinner wall and in cases where the intrapelvic pressure rises above 25 -75 mmHg (4). In a systematic review of 108 cases, Gershman et al., indicated that stone-related obstruction (74.1%) was the most common cause of spontaneous renal pelvis rupture (5). Compressions caused by abdominal/pelvic masses or pregnancy, retroperitoneal fibrosis, congenital abnormalities, iatrogenic or post-radiation strictures are among the other causes. In the same study, in 8.3% of the cases, any etiologic factor for rupture could not be demonstrated.

It has been reported that the increased pressure within the pelvicalyceal system may cause rupture of the renal pelvis, leading to urinary extravasation (6). Contrast agents are reported to be strong osmotic diuretics and accelerate rupture in acute obstructive conditions (7). In another study, a positive association between the incidence of peripelvic extravasation of contrast agent and intravenous dose of contrast agent has been demonstrated in patients presenting with acute renal colic (8). In another study, Chien et al. reported a case of bilateral spontaneous renal rupture after administration of opaque agent to a patient with increased residual urine due to benign prostatic hyperplasia (9). Our case may also be important in terms of showing the relationship between contrast material and urine extravasation. In our case, urinary extravasation was not observed in the early period following the administration of contrast material, while obvious

urinary extravasation was observed in the late period. This is an important finding as it shows that administration of contrast agent facilitates the development of spontaneous renal rupture in the obstructed urinary tract.

Spontaneous retroperitoneal hematoma is also a rare condition, defined as retroperitoneal bleeding that occurs without an underlying pathology, trauma, surgery, or invasive intervention (10). The retroperitoneal space is located just behind the peritoneum and it is divided into three zones as: the central-medial zone (Zone I), the perirenal zone (Zone II) and the pelvic zone (Zone III) which includes the bladder (11). Rupture of parenchymal lesions such as angiomyolipomas, cysts, and renal carcinomas or aneurysms of the retroperitoneal vessels can lead to spontaneous retroperitoneal bleeding. It has been reported that a high degree of clinical suspicion is required to make a diagnosis (11). It is a clinical picture progressing with high mortality and morbidity rates, and it has been reported to be frequently associated with anticoagulant use (12). In the literature, a mortal case of massive retroperitoneal hemorrhage due to enoxaparin use has been reported (13). In a previous study, it was reported that endothelial damage is an important clinical finding in severe Covid-19 patients (14). Therefore, it has been stated that the risk of thrombosis or bleeding in critically ill patients with Covid-19 is higher than in healthy people (15). The patient we described was also receiving enoxaparin treatment for Covid-19 infection. Respiratory distress and increased pressure due to coughing may be the cause of bleeding in this patient receiving anticoagulant therapy.

The main principle for the treatment of spontaneous rupture of the renal pelvis is to eliminate the underlying problem, if possible. As in our case, by evacuating the hematoma, relieving pressure on the ureter and reducing renal pressure can provide spontaneous recovery. However, in cases where obstruction cannot be eliminated immediately, such as tumor invasion, a double J ureteral stent should be inserted, and if not possible, a percutaneous nephrostomy tube should be inserted to provide decompression of the kidneys. Use of anticoagulants is prevalent in most patients with spontaneous retroperitoneal hematoma, and a reversal of the coagulopathy is required to prevent further bleeding (11). If needed, blood transfusion should be performed. Sometimes, if the bleeding focus can be localized, embolization may be required. More rarely, the patient's hemodynamic parameters may be impaired and surgical intervention may be required, as in our case.

CONCLUSION

In our study, we report a case of spontaneous rupture of the renal pelvis that occurred in patient with Covid-19 infection who were receiving anticoagulants. The reason for the rupture was the hematoma that developed due to spontaneous retropertioneal bleeding causing obstruction by compressing the ureter. Widespread endothelial cell damage associated with Covid-19 infection might be the underlying mechanism for the spontaneous retroperitenal bleeding. Therefore, in patients with Covid-19 infection spontaneous renal rupture and spontaneous severe retroperitoneal bleeding should be considered as a possible urological emergency.

Conflict of Interest

All authors declared that there is no conflict of interest.

Financial Disclosure

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Author Contributions

Conception and design; OA, ME, ND, KÇ, Data acquisition; OA, ME, Data analysis and interpretation; OA, ME, ND, KÇ, Drafting the manuscript; OA, ME, ND, Critical revision of the manuscript for scientific and factual content; OA, ME, ND, KÇ, Supervision; OA, KÇ.

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