

# Massive Hematuria in an Acute Myeloid Leukemia Patient That Required Transcatheter Embolization

## Akut Myeloid Lösemi Hastasında Transkateter Embolizasyon Gerektiren Masif Hematüri

Olgu Sunumu  
Case Report

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### ABSTRACT

Acute myeloid leukemia patients develop thrombocytopenia due to chemotherapy and bone marrow transplantation. Thrombocytopenia-induced bleeding can be encountered at rates of 20-32% in these patients. In this case presentation, we aimed to describe the process experienced by a patient who did not manifest significant thrombocytopenia or tumoral formations in the bladder but presented with hematuria following chemotherapy, which was resolved with embolization, and to stress that embolization is a treatment modality that should always be kept in mind.

**Keywords:** Massive hematuria, acute myeloid leukemia, transcatheter embolization

### Öz

Akut myeloid lösemi hastalarında kemoterapi ve kemik iliđi transplantasyonuna bađlı trombositopeni gelişmektedir. Trombositopeniye bađlı kanama bu hastalarda %20-32 oranında görülebilmektedir. Biz de bu vaka sunumunda belirgin trombositopeni izlenmeyen, mesanede de tümöral oluşum görülmeyen kemoterapi sonrası hematürisi olan AML hastasında, embolizasyon ile sonuçlanan süreci anlatarak, embolizasyonun her zaman akılda tutulması gereken bir tedavi modalitesi olduğunu vurgulamak istedik.

**Anahtar kelimeler:** Masif hematüri, akut myeloid lösemi, transkateter embolizasyon

### INTRODUCTION

Acute leukemia (AL) may concisely be described as a malign disease that results from the infiltration of the bone marrow by immature hemato-poietic cells <sup>(1)</sup>. AL can be categorized under two main groups, which are acute myeloid leukemia (AML) and acute lymphoblastic leukemia (ALL). The treatment modalities such as chemotherapy and bone marrow transplantation (BMT) that are being used in AL patients cause thrombocytopenia. Thus, bleeding appears as a treatment complication in AL patients <sup>(2)</sup>.

Therefore, in this case presentation, we aimed to present the persistent complaint of hematuria in a patient who had undergone BMT treatment due to AML and to emphasize once again what could be done in such a case.

### CASE PRESENTATION

A 58-year-old male patient had been diagnosed with AML two years ago. He had undergone BMTs 8 months and 10 days prior to his presentation. Our patient had received chemotherapy before his latest BMT. The patient

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who presented to the emergency service of our hospital due to hematuria, had Hb levels of 10.3 gr/dL, a platelet count of 114000/uL, and an INR of 1.07. His computed tomography (CT) demonstrated bladder wall irregularities in that manifested a polypoid protrusion into the lumen, diffuse increase in bladder wall thickness, and a 27x24 mm area resembling a fishnet inside the bladder lumen; and the evaluation favored hematoma (Figure 1). The hematoma inside the bladder was evacuated during cystoscopy, however, the appearance of the bladder did not suggest malignancy. The patient, who had been discharged due to resolution of hematuria, presented two days later with a similar complaint. CT Urography was obtained which did not reveal any pathology in upper urinary system. The patient, who manifested Hb levels of 8.7 gr/dL, a platelet count of 61000/uL, and an INR of 1.02, underwent cystoscopy again under general anesthesia, however, hematoma or tumoral pathology was not detected in the bladder. Foci of leakage-type bleeding were fulgurated. There was no need for random biopsy and only sample for cytologic examination was obtained which was reported as a benign lesion. As his hematuria problem persisted after the operation, blood and blood components were transfused based on the suggestion of a hematologist [In total, 17 units of erythrocyte suspension (ERT), 8 units of fresh frozen plasma (FFP), 12 units of thrombocyte suspension, and 10 doses of factor VII]. The patient demonstrated persistent hemorrhage in spite of a platelet count that exceeded 100000/uL. During monitorization his blood



Figure 1. Axial section of the bladder lumen in CT.

pressure (BP) decreased to levels as low as 80/50 mmHg. On the 15<sup>th</sup> day of hospitalization transcatheter embolization was planned. The images obtained during embolization revealed hypervascular lesions that were fed by the inferior vesical artery on the left and the superior vesical artery on the right side. These arteries were embolized with 400-micron microsphere particles. Follow-up angiograms showed that the hypervascular lesions had disappeared (Figure 2).

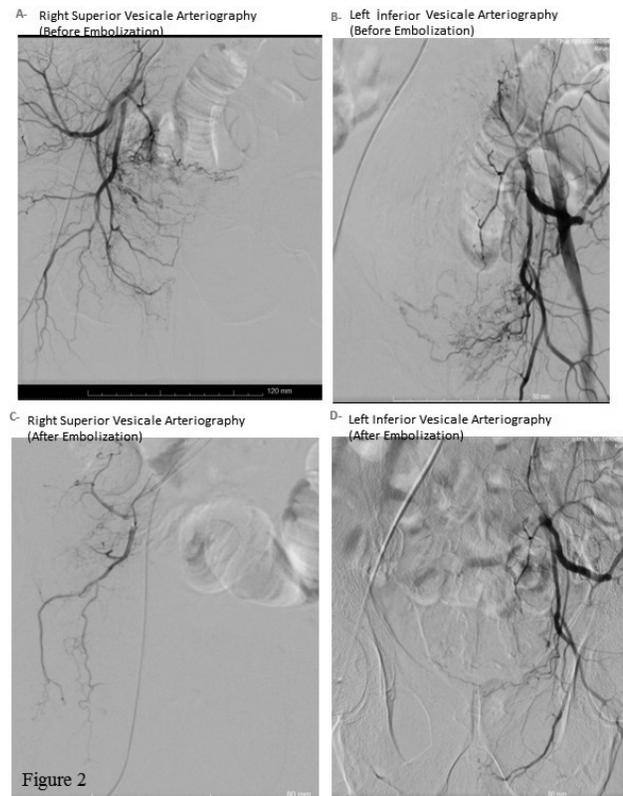


Figure 2. Pre- and post-embolization images.

The patient who demonstrated normal BP values and whose hematuria resolved was discharged with certain recommendations.

## DISCUSSION

In AML patients, hematuria rarely manifests as an initial complaint. The actual reason behind hematuria encountered in this patient group is thrombocytopenia that appears due to the use of cytotoxic chemotherapy agents, namely either standalone or

another agent combined with BMT <sup>(3)</sup>. A review of the literature reveals that thrombocytopenia-induced bleedings (including petechia, ecchymosis) are encountered in 20-32% of AML patients <sup>(4)</sup>. According to the classification by the World Health Organization (WHO), petechial hemorrhages are described as Grade 1; bleedings such as melena, hematemesis, hematuria, and hemoptysis as Grade 2; any bleeding that requires blood transfusion as Grade 3; and fatal hemorrhages such as retinal and cerebral hemorrhage as Grade 4 <sup>(5)</sup>. Our case can be considered as Grade 3 because our patient required blood transfusion and vital functions were affected resulting in life-threatening levels of hypotension. The interesting aspect of this case was that massive hematuria was seen despite a platelet count exceeding 50000/uL and that no mucosal pathology besides hematoma was observed in cystoscopy. One other reason for hematuria in AML patients besides thrombocytopenia is the infiltration of the bladder by leukemia, which has been reported in few studies in the literature <sup>(6,7)</sup>. In a study by El-Assmy et al., treatments used in cases of hematuria due to bladder tumor were inspected and it was determined that seven patients had undergone transcatheter arterial embolization (TAE) over a period of 7 years <sup>(8)</sup>. Patients who present with hematuria can be followed-up with irrigation and saline solution, however, bleeding persists in some cases and further diagnoses and treatments are required. For this reason, patients undergo cystoscopies and, if present, tumors are resected and hemorrhagic foci are coagulated. Even cystectomy and ileal diversion are options in the case of more severe bleeding <sup>(8,9)</sup>. Embolization is an alternative treatment method in cases where endoscopic surgery cannot be performed or imaging is not satisfactory. Embolization was first defined in 1974, and since that time, internal iliac artery embolization has become established as an alternative treatment in cases of bleeding induced by pelvic tumors <sup>(10,11)</sup>. A review of earlier studies shows that embolization was successfully has been used not only in cases of bleeding induced by malignancies

but also in cases of hematuria encountered during the postoperative period in patients who had undergone endoscopic surgeries such as transurethral prostatectomy (TUR-P) <sup>(12)</sup>. Studies have been conducted to predict bleeding encountered in AML patients. Weber et al. determined that the most important parameter that predicted diffuse bleeding in AML patients was a low platelet count. They reported that each  $1 \times 10^9/L$  increase in platelet count translated to a 4% decrease in presence of bleeding the next day. In the same study, it was stated that high Hb levels were associated with a delay in clinically significant bleeding but were inadequate in predicting diffuse bleeding <sup>(3)</sup>. In our patient, any tumoral formations were not seen in the bladder and any significantly bleeding arteries were not identified. In brief with platelet levels exceeding 50000/uL as well, the cause of hematuria could not be completely clarified in our patient. Hematuria affecting his vital functions called for embolization, and the right superior and the left inferior vesical arteries were embolized. To conclude, we would like to emphasize that time is extremely valuable in cases of massive hematuria that present in malignancies such as AML. Minutes of delay may sometimes cost the patients their lives. Therefore, embolization performed as an alternative to endoscopic or open surgery must absolutely be considered as a treatment modality that could save the patient's life in this critical period.

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**Conflict of Interest:** None.

**Informed Consent:** None.

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