

# Left-Anterior Sided Inferior Vena Cava Complicated Abdominal Aortic Surgery

## ABDOMİNAL AORT CERRAHİSİNDE KOMPLİKASYONA NEDEN OLAN SOL-ANTERİÖR YERLEŞİMLİ İNFERİÖR VENA KAVA

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### Abstract

Although most aortic surgery is now routinely performed without any complication, major venous anomalies, which are rarely encountered in patients undergoing aortic surgery, can cause unexpected bleeding. Unexpected venous injuries complicate the operation for aortic surgery if no attention is given in preoperative imaging. Here we present a patient who has inferior vena cava lying anteriorly and an abdominal aortic aneurysm. We recommend the routine use of CT scanning for preoperative work-up to avoid risk in unexpected bleeding during abdominal aortic surgery.

**Key Words:** Aortic aneurysm, vena cava

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### Özet

Aortaya ait cerrahi girişimler günümüz damar cerrahisinde neredeyse sorunsuz olarak gerçekleştirilmektedir. Eğer cerrahi girişim sırasında büyük damarlara ait doğumsal veya edinsel anomaliler var ise beklenmeyen kanamalar gözlenebilir ve cerrahi işlemi komplike hale getirebilir. Preoperatif dönemde bu tip damarsal anomaliler düşünülüp gerekli görüntüleme yöntemleri kullanılmalıdır. Bu olgu sunumunda, normal yerleşim yerinden farklı olarak anteriora seyreden inferior vena cava ve bunun hemen arkasında yerleşim gösteren abdominal aort anevrizmasına yapılan cerrahi bildirilmiştir. Abdominale ait damar operasyonlarında preoperatif dönemde bilgisayarlı tomografinin, damara ait anomalileri tespit edip, gelişebilecek ciddi kanama komplikasyon riskini önlemek amacıyla rutin olarak kullanılmasını önermekteyiz.

**Anahtar Kelimeler:** Abdominal aort anevrizması, vena cava

Abdominal aortic surgery is performed with acceptable rates of morbidity and mortality. Unexpected complications like major vascular injuries although they are extremely rare are responsible for life-threatening intraoperative bleeding.<sup>1</sup> These injuries are the consequence of the unexpected variations in the site and course of the inferior vena cava.

A case of abdominal aortic aneurysm with concomitant anomaly at the site and course of the inferior vena cava is reported.

### Case Report

A man aged 64 years was admitted to our

institution with the diagnosis of abdominal aortic aneurysm on abdominal ultrasound. He had a history of coronary artery bypass. The patient was subjected to CT scanning of abdomen, which confirmed the presence of aneurysm 6.7 cm in diameter, and also abnormal localization of inferior vena cava previously not detected on ultrasound (Figure 1).

The patient was taken to operating room and laparotomy was performed. The exploration of the abdominal cavity revealed the existence of the abdominal aortic aneurysm. The aneurysm was prepared from the level of the renal arteries as far as the bifurcation of the iliac vessels. The inferior vena cava, from the level of the junction of the iliac veins, was located anterior to the aortic aneurysm sac, continuing irregular course on the anteriorly towards to renal arteries. The inferior vena cava was prepared and separated from the

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**Figure 1.** Computed tomography of the chest showing abdominal aortic aneurysm and anomalous inferior vena cava (arrows). AAA: Abdominal aortic aneurysm.

aneurysmatic sac at the level of the junction of the two iliac veins as far as the level of the renal arteries where the inferior vena cava continues its regular course. Resection of the aneurysm followed and aorto-bifemoral graft interposition was performed. Following hemostasis, closure of the aneurysmatic sac over the graft and posterior peritoneum were carried out and the surgical wound was closed in layers.

The postoperative course of the patient was uneventful. Patient was discharged from the hospital on the 5<sup>th</sup> postoperative day.

### Discussion

Anomalies of the site and course of the inferior vena cava and its branches were found in 16% of the autopsy material, although clinically significant anomalies are less common.<sup>2</sup>

The abnormalities of the site and course of the inferior vena cava with its branches have a special significance in the abdominal surgery. Double inferior vena cava, left-sided vena cava are the main anomalies, which were encountered in the literature.<sup>3,4</sup>

Normally, the inferior vena cava arises by the junction of right and left common iliac veins, slightly below the level of the bifurcation of the aorta and between the right common iliac artery anteriorly and the fifth lumbar vertebra posteriorly. In its infrarenal course, it almost parallels the aorta,

lying to the right of this; at first it lies in a slightly more posterior plane, but as it ascends it courses gradually both a little to the right and anteriorly, and in its suprarenal portion diverges from the aorta.

In our case, the inferior vena cava, from the level of the junction of the iliac veins, was located anterior to the aortic aneurysm sac, continuing irregular course on the anteriorly towards to renal arteries. The inferior vena cava was attached to the aneurysm sac, which makes the aneurysm resection more complicated. The proximal control of the abdominal aorta during an aneurysmectomy was difficult to obtain because anomalous inferior vena cava was found stretching across the anterior surface of the large aneurysm. In this kind of anomalies of inferior vena cava might associate with other anomalies as left-sided inferior vena cava as well as left renal vein, which was not encountered in our case, so caution should be applied when applying the proximal clamp.

Preoperative computed tomography is useful for diagnosing major venous anomalies, although its routine use in patients with an abdominal aortic aneurysm is controversial. This technique avoids the risk of unexpected bleeding.

In conclusion, in a patient requiring abdominal aortic surgery, careful investigation for the variations in the site and course of the inferior vena cava is mandatory. Furthermore, intraoperative awareness is necessary as venous anomalies are frequently overlooked preoperatively. So the surgeon can prevent inadvertent injury to an anomalous inferior vena cava, which leads significant bleeding during abdominal aortic surgery.

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