

# Epidural Anesthesia and Endovascular Repair of Abdominal Aortic Aneurysm Case Presenting with Severe Pulmonary Disease

*Ağır Akciğer hastalığının Eşlik Ettiği Abdominal Aorta Anevrizması Olgusunda Epidural Anesteziyle Endovasküler Tedavi*

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## ABSTRACT

Endovascular surgery simplifies repair of abdominal aortic aneurysms. As a result, many patients with comorbidities are being operated. Anaesthetic plan of such patients should be planned according to their specific conditions. We aimed to describe the anesthetic management of a patient with severe obstructive pulmonary disease scheduled for endovascular abdominal aortic aneurysm repair.

**Key words:** endovascular abdominal aneurysm repair; epidural anesthesia; perioperative complications

## ÖZET

Endovasküler cerrahi, abdominal aort anevrizmalarının tedavisini kolaylaştırmaktadır. Bunun sonucunda, ek hastalıkları olan pek çok hasta ameliyat edilmektedir. Bu tür hastaların anesteziyi, kendilerine özgü sorunlara yönelik planlanmalıdır. Endovasküler abdominal aortik anevrizma onarımı planlanan, ağır obstrüktif akciğer hastalığı olan bir olguda anestezi yönetiminizi sunmayı amaçladık.

**Anahtar kelimeler:** endovasküler abdominal aort anevrizması onarımı; epidural anestezi; perioperatif komplikasyonlar

## Introduction

Aortic aneurysm is common in elderly. There is no effective treatment, so palliation and regular checkups are important<sup>1</sup>. Vascular prosthesis replacement via open surgery was the main treatment option until recently however invasive endovascular techniques are increasingly used<sup>2</sup>. Endovascular abdominal aortic aneurysm repair has a decreased complication rate compared to major surgery requiring general anesthesia. Major advantages are reduced blood loss, hospital stay and no

need for general anesthesia. All these advantages contribute to decreased mortality and morbidity<sup>3</sup>. This paper describes the anaesthetic management of an old patient presenting with severe obstructive pulmonary disease scheduled for endovascular abdominal aortic aneurysm repair.

## Case Report

A 71 year old male presented to our emergency department with abdominal pain and nausea. Medical history consisted of chronic obstructive pulmonary disease, pneumonia, hypertension, previous history of smoking and tuberculosis, which was successfully treated. Physical examination was unremarkable except for rales in the right lung, prolonged expirium and arterial hypoxia (Peripheral oxygen saturation: 87–90% despite six l/min oxygen therapy). Respiratory function tests showed severe obstruction (Forced expiratory volume in one second: 38%, forced expiratory volume in one second/forced vital capacity: 0.56). Computerised tomography revealed bilateral apical fibrotic sequels, traction bronchiectasis, peribronchovascular thickenings and emphysematous regions in the lungs, 40 mm wide ascending aorta with 13 mm wide patchy hypodense lesions, 58 mm wide aortic aneurysm located between the iliac artery and distal end of the superior mesenteric artery with 22 mm wide patchy hypodense regions (Fig. 1). These hypodense areas were initially thought of as thrombosis. As laboratory values were consistent with pneumonia (CRP: 25,3 mg/dl, WBC: 11.5 K/uL, sedimentation rate: 84), empirical antibiotherapy, oral and inhaler bronchodilator therapy, and prophylactic anticoagulant

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Geliş Tarihi: 04.11.2014 • Kabul Tarihi: 12.03.2016



**Figure 1.** Seventy-one-year-old male presenting with abdominal pain and nausea was subsequently diagnosed with thrombosed abdominal aortic aneurysm. Contrast enhanced preoperative tomography. Axial plane at the first lumbar vertebra shows thrombosed abdominal aortic aneurysm (T), the shaggy aorta (A) and calcified borders (white arrow).

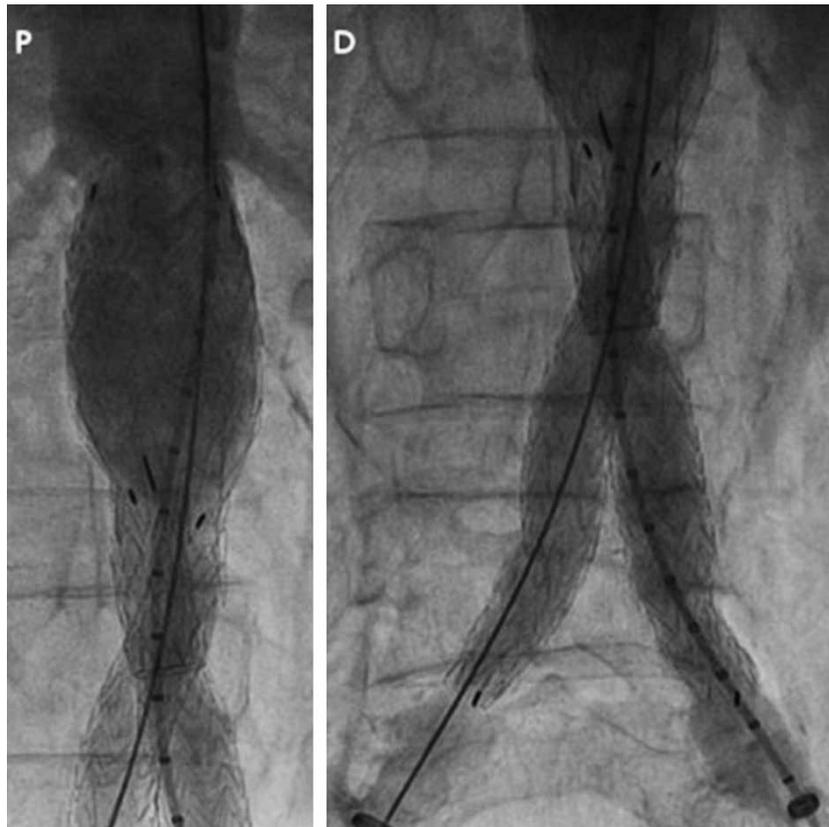
therapy with 100 IU/kg enoxaparin once a day was initiated. At the tenth day, infection signs regressed, pulmonary function was slightly better (Peripheral oxygen saturation: 92% with two l/min nasal oxygen therapy, forced expiratory volume in one second: 45%, forced expiratory volume in one second/forced vital capacity: 0.68). Cardiovascular surgeons planned endovascular abdominal aortic aneurysm repair.

Following routine monitorization and iv infusion of %0.9 NaCl, we catheterized the radial artery, the right internal jugular vein and the epidural space through L1-2 intervertebral space. We achieved sensorial block at T8 (confirmed with pin prick test at anterior axillary line) with bolus doses of 0,025% levobupivacaine (a total of 20 ml within 20 min) and sedation with 0.02 mg/kg dormicum. The initial blood pressure of 100/55 mmHg dropped to 84/43 mmHg. Therefore, we started an infusion of dopamine at a rate of five mcg/kg/min, to prevent fluid overload. The surgeons cannulated right femoral artery, placed an infrarenal graft and an iliac artery graft to the contralateral side (Fig. 2). Surgery ended in one hour without any complications or further need for analgesics. The patient was followed-up in the cardiovascular surgery ward for three days anticipating complications such as hemodynamic disturbances or pleural effusion. At third postoperative

day, the patient was transferred to the infection ward to be discharged with oral antibiotic therapy.

## Discussion

Abdominal aortic aneurysms are usually seen in elderly men with co-morbid diseases such as hypertension, chronic obstructive pulmonary disease, coronary artery and cerebrovascular disease, diabetes mellitus renal disease<sup>4</sup>. Until now, surgery was the main form of treatment. Recently minimally invasive endovascular techniques are becoming popular as they are easier to perform and are associated with decreased rate of morbidity and mortality, mainly because they do not require general anesthesia<sup>5</sup>. Preoperative evaluation of this case showed severe obstructive respiratory disease, which is associated with high perioperative complication rates due to arterial hypoxia and postoperative respiratory insufficiency. Therefore, endovascular abdominal aortic aneurysm repair via regional anesthesia was the most appropriate choice in this patient. Although endovascular technique costs much more compared to open surgery, it compensates for the difference with shorter hospital stay and fewer complications. This difference is especially notable in elderly patients presenting with co-morbid diseases and complications due to analgesic therapies<sup>6</sup>.



**Figure 2.** Seventy-one-year-old male was operated using endovascular surgical technique with the diagnosis of abdominal aortic aneurysm. Postoperative angiogram extending from third lumbar to second sacral vertebra shows infrarenal (P) and iliac (D) grafts.

Epidural anesthesia in endovascular abdominal aortic aneurysm repair is advantageous because it totally eliminates postoperative pain and provides hemodynamic stability during the procedure. In this case, epidural anesthesia prevented complications associated with intubation like laryngospasm, bronchospasm and hypertension, and also perioperative pulmonary complications like increased secretions and atelectasis. We experienced hypotension due to high level of anesthesia, which was easily treated with low dose of dopamine infusion.

## Conclusion

Elderly abdominal aortic aneurysm patients complicated with pulmonary comorbidities can be efficiently treated with endovascular technique and regional anesthesia. The authors think that endovascular surgical technique and regional anesthesia shortens hospital stay and minimizes perioperative pulmonary complications associated with general anesthesia.

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