Austin Journal of Clinical Case Reports

Open Access

Austin Publishing Group

Case Report

Open Conversion Abdominal Aortic Endograft in Thoracic Epidural Anesthesia alone in Patient with Severe COPD: A Case Report of Surgery in awake Patient and Review of the Literature

Grazioli L[1*]; Mezzapesa M[1]; Pirrelli S[2]; Zuccon GM[2]; Bianchi I[1]; Monti M[1]; Lorini L[1]

[1]Department of Emergency and Critical Case, ASST Papa Giovanni XXIII Bergamo, Italy

[2]Department of Cardiovascular, ASST Papa Giovanni XXIII Bergamo, Italy

***Corresponding author: Lorenzo Grazioli**

Department of Emergency and Critical Case, ASST Papa Giovanni XXIII Bergamo, Italy.

Email: lgrazioli@asst-pg23.it

Received: June 24, 2023

Accepted: July 22, 2023

Published: July 29, 2023

Case Report

A 79-year-old male was referred, with open abdomen surgical indication, for an asymptomatic iuxtarenal abdominal aortic aneurysm and type I endoleak with distal migration of an endovascular aortic – bisiliac prosthesis, after an endovascular correction done eight years before. This patient has several comorbidities such severe COPD (Stage IV and oxygen dependent), chronic kidney disease (G4 KDIGO CKD classification), systemic arterial hypertension and severe peripheral vasculopathy. Spirometry gives a picture of severe obstruction: FVC 2,44 L (68%), FEV1 0,68 L (25%), TLC 7.72 L (118%), RV 4,88 L (181%). 3 L/min oxygen arterial blood gas was: pH 7,34, PaO2 74,9 mmHg, PaCO2 51,2 mmHg, HCO3- 24,3 mEq/L, BE – 0,2, SpO2 94,2%. Cardiological consultation did not found any problem (normal ejection fraction, no valvular pathologies, and no pulmonary hypertension). Vascular echography highlighted an aortic aneurysm, confirmed by computed tomography angiography: iuxtarenal abdominal aortic aneurysm of 68 mm × 72 mm extended for 70 mm (Figure 1). According to the European Society of Anesthesiologists guidelines [1,2], general anesthesia is not safe, because of the elevated perioperative risks of severe respiratory complications. After a collegial respiratory risk evaluation, we have decided for an awake surgery with an epidural anesthesia. Operative risks were assessed with the patient who accepted intervention.

Anesthesiologic Management

Conventional premedication has been given in the surgical ward (lorazepam os 1 mg). Patient has been conducted in operating room, where 2 large bore peripheral vein have been placed. Arterial catheter and advance cardiac output monitoring (Flotrac Edwards Life Sciences, Newbury, West Berkshire, England) through radial artery has been established. A 19 Gauge epidural catheter was placed through 17 Gauge Tuohy needle, in T9-T10 space and advanced for 5 cm in the epidural space. Aspiration test, for intravascular placement, and Bupivacaine/Epinephrine 0.5% 3 mL injection, to exclude subarachnoid space puncture, were negative. Epidural anesthesia induction has been obtained with bolus of Ropivacaine 0.5% 10 mL (50 mg) and Morphine 1 mg bolus. After 10 minutes anesthesia level extended from T7 to L1. Ropivacaine 0.2% 4 mL/h epidural infusion has been started at the skin incision. We have completed monitoring with 7,5 French triple lumen central line. After surgical isolation of aortic aneurysm, we have administered ropivacaine 0.5% 5 ml (25 mg) and lidocaine 2% 3 ml (60 mg) boost. Patient was maintained on spontaneous breathing with 3L/min oxygen supplementation through nasal cannula achieving peripheral oxygen saturation between 94% - 95%. At arterial blood gas no sign of respiratory acidemia. The patient tolerated well the surgical procedure. Hemodynamic was stable during all the procedure and blood loss was estimated about 600 ml

Citation: Grazioli L, Mezzapesa M, Pirrelli S, Zuccon GM, Bianchi I, et al. Open Conversion Abdominal Aortic Endograft in Thoracic Epidural Anesthesia alone in Patient with Severe COPD: A Case Report of Surgery in awake Patient and Review of the Literature. Austin J Clin Case Rep. 2023; 10(5): 1294.

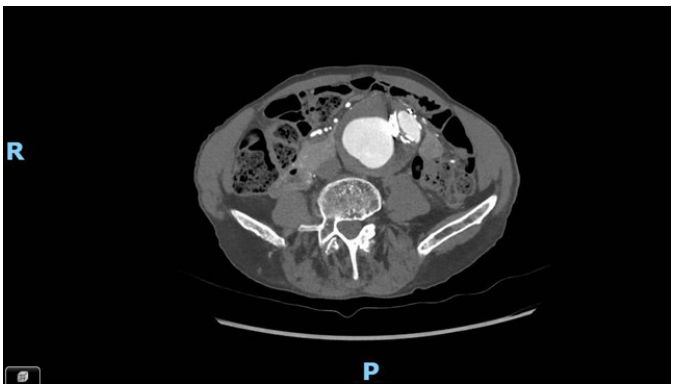

Figure 1: Angio CT highlighting abdominal aortic aneurysm and endoprosthesis distal migration.

(125 ml has been cell saved). Patient received 2000 mL of crystalloid replacement and one unit of red blood cells. At the end of surgery patient was recovered in Intensive Care Unit for 24 hours. No major event has occurred during ICU admission, so the patient was discharged the day after surgery. Total hospital stay was 10 days.

Surgical Management

A supra and sub-umbilical laparotomy was made (cut about 20 cm) with a retroperitoneum incision and iuxtarenal aorta isolation up to the iliac bifurcation. Iuxtarenal and bisiliac clamps were positioned before aortotomy. No necessity of suprarenal clamping, due to migration of aortic endograft. Then the endoprosthesis was removed and aneurysmectomy performed with bifurcated prosthesis graft. Distally the prosthesis is anastomosed on the iliac branches connected to the wall of the native vessels. The total clamp time was 48 minutes. The closure of the abdominal wall was performed without any problems.

Discussion

It has been already demonstrated that aortic aneurysm repair open surgery is associated with significant postoperative mortality and morbidities, especially in patients with important preexisting comorbidities [3]. In literature, awake aortic surgery procedures have already been described, with emphasis on technique's advantages in selected cohort of patients. One of the first report dates early 90s. In 1990, Pecoraro et al [4]. described the first ten patients case series in which epidural anaesthesia alone was associated to a retroperitoneal approach for aortic surgery. Patients were not heterogeneous in term of surgical risk and comorbidities. A bigger case series has been presented by Rosenbaum et al [5]. in 1994 with 62 patients operated of infrarenal aortic disease via retroperitoneal approach with lumbar epidural anesthesia alone. No major pulmonary complication, pneumonia, or necessity for intubation were detected by the Authors. In 1999 McGregor [6] and colleagues have reported a retrospective observational study on six patients operated for aortoiliac aneurysm via retroperitoneal approach and regional anesthesia only. Patients were awake and anesthesia was based on combined spinal and epidural anesthesia at L2 - L3 or L3 - L4 vertebral space. Differently from other studies, McGregor et al. have focused on the effects of retroperitoneal aneurism surgery approach with regional anesthesia in high-risk pulmonary patients. Despite observational study limits, this work demonstrated that patients with severe respiratory comorbidities can undergo safely on elective open aortic surgery under neuraxial anesthesia alone without respiratory morbidity. In 2007, Kalko [7] and colleagues compared effects of epidural versus general anesthesia techniques in the treatment of aortic abdominal aneurisms through mini laparotomy incision (7-10 cm length), in patients with severe chronic obstructive lung disease. Ten patients received thoracic epidural anesthesia (T8-T11 level) and thirteen underwent general anesthesia. For all, surgical technique was mini-laparotomy. They highlighted a statistically significant reduction of ICU and in-hospital stay in the epidural technique group. Another case series was published by Berardi et al [8]. in 2009. Seven severe COPD patients were treated for infrarenal abdominal aortic aneurysm with combined spinal and epidural anesthesia for open abdomen surgical repair. The epidural catheter was placed at T8-T9 level and spinal anesthesia was established through a puncture at L2-L3 space. The surgical approach was made with a subcostal incision to reduce the abdominal wall tension in the absence of muscle relaxation.

Novelty about our case is that nor retroperitoneal approach, nor mini laparotomy surgical technique were suitable for this patient. Although not described in literature, we performed the association of a thoracic epidural technique alone and a laparotomic transperitoneal surgical approach. We decide to not perform subarachnoid anesthesia, to have less hemodynamic impact. Because of the surgical need of removing the endovascular prosthesis prior the aneurysmectomy, we opted for a thoracic epidural technique, and not lumbar as described elsewhere, to obtain a sensitive block up to T7-T6 and be ready for a laparotomy extension. In fact, first objective of our anesthesiologic strategy was the avoidance of emergency endotracheal intubation and general anesthesia. As described elsewhere [9], open abdomen aortic aneurysm morbidity and mortality rates vary from 12% to 26% and 4% to 6%, respectively, and the association of epidural anesthesia with general anesthesia is linked to an improved survival if compared to general anesthesia alone. Besides, the hemodynamic effects of Epidural Anesthesia (EA) maintain their benefits also when EA is used alone, as in our case. In fact, EA causes modulation of spinal sympathetic outflow and vasodilation with consequent reduction of left ventricle afterload and improved organ perfusion.

Conclusion

Awake aortic aneurysm repair, also in conversion of a failed endovascular repair, with thoracic epidural anesthesia alone and transperitoneal laparotomic access could be a valid alternative in severe COPD patients where predicted perioperative respiratory complications preclude GA and endovascular treatment is technically prohibitive. Structured studies are needed to confirm if the use of thoracic epidural anesthesia may have cumulative benefits on high-risk patients.

References

1. De Hert S, Staender S, Fritsch G, Hinkelbein J, Afshari A, et al. Pre-operative evaluation of adults undergoing elective noncardiac surgery: updated guideline from the European Society of Anaesthesiology. Eur J Anaesthesiol. 2018; 35: 407-65.

2. Fernandez-Bustamante A, Frendl G, Sprung J, Kor DJ, Subramaniam B, et al. Postoperative pulmonary complications, early mortality, and hospital stay following noncardiothoracic surgery: a Multicenter Study by the Perioperative Research Network Investigators. JAMA Surg. 2017; 152: 157-66.

3. Tassiopoulos AK, Kwon SS, Labropoulos N, Damani T, Littooy FN, et al. Predictors of Early Discharge following Open abdominal aortic aneurysm Repair. Ann Vasc Surg. 2004; 18: 218-22.

4. Pecoraro JP, Dardik H, Mauro A, Wolodiger F, Drascher G, et al. Epidural anesthesia as an adjunct to retroperitoneal aortic surgery. Am J Surg. 1990; 160: 187-91.

5. Rosenbaum GJ, Arroyo PJ, Sivina M. Retroperitoneal approach used exclusively with epidural anesthesia for infrarenal aortic disease. Am J Surg. 1994; 168: 136-9.

6. McGregor WE, Koler AJ, Labat GC, Perni V, Hirko MK, et al. Awake aortic aneurysm repair in patients with severe pulmonary disease. Am J Surg. 1999; 178: 121-4.

7. Kalko Y, Ugurlucan M, Basaran M, Aydin U, Kafa U, et al. Epidural anaesthesia and mini-laparotomy for the treatment of abdominal aortic aneurysms in patients with severe chronic obstructive pulmonary disease. Acta Chir Belg. 2007; 107: 307-12.

8. Berardi G, Ferrero E, Fadde M, Lojacono N, Ferri M, et al. Combined spinal and epidural anesthesia for open abdominal aortic aneurysm surgery in vigil patients with severe chronic obstructive pulmonary disease ineligible for endovascular aneurysm repair. Analysis of results and description of the technique. Int Angiol. 2010; 29: 278-83.

9. Bardia A, Sood A, Mahmood F, Orhurhu V, Mueller A, et al. Combined epidural-general anesthesia vs general anesthesia alone for elective abdominal aortic aneurysm repair. JAMA Surg. 2016; 151: 1116-23.