

# Ruptured Abdominal Aortic Aneurysm Treated By Endovascular Aneurysm Repair Under Local Anaesthesia

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## SUMMARY

A 68 year old man with significant cardiorespiratory risks factors presented with a ruptured thoracic aortic aneurysm (TAA). This was treated by emergency thoracic endovascular aneurysm repair (TEVAR) under general anaesthesia (GA). An incidental abdominal aortic aneurysm (AAA) was not treated. Eight months later, he presented with ruptured AAA. Due to the patient's compromised respiratory system, he underwent endovascular aneurysm repair (EVAR) under local anaesthesia (LA). He had a smoother post-operation recovery compared to the first repair under GA.

## KEY WORDS:

*Ruptured aortic aneurysm; Endovascular, EVAR; Anaesthesia*

## INTRODUCTION

Abdominal aortic aneurysm (AAA) is an abnormal localised dilatation of the abdominal aorta of at least 1.5 times its normal diameter or more than 3cm in total diameter. In the UK, its incidence is 25 per 100,000 in 50 year old males increasing to 78 per 100,000 in 70 year old males. Thoracic aortic aneurysm (TAA) is slightly more uncommon with an incidence of 10.4 per 100,000 inhabitants. The annual risk of rupture for AAAs with diameter of greater than 6cm is 25%; and the 5-year survival rate of untreated aneurysms with a diameter of greater than 5cm is 20%. Definitive treatment of AAAs can either be an open surgical repair or an endovascular aneurysm repair (EVAR).

## CASE REPORT

A 68 year old man with multiple significant co-morbidities presented with abdominal pain and shock from a ruptured AAA. His co-morbidities were smoking, severe obstructive pulmonary disorder (COPD), ischaemic heart disease (previous coronary angioplasties) and hypercholesterolaemia. Eight months earlier, he presented with a ruptured TAA. A computed tomography angiogram (CTA) performed showed a 10 cm ruptured TAA and a 6 cm infrarenal AAA that was intact. As the AAA was asymptomatic, and in view of the patient's condition, it was not treated. The TAA was treated by emergency thoracic endovascular aneurysm repair (TEVAR) under general anaesthesia (GA). The post-operation complications were haemothorax, which required tapping, and exacerbation of his COPD. He responded to treatment and was discharged on the 10th post-operation day.

His recovery at home was slow due to his chronic respiratory condition. He was breathless on minimal exertion. A respiratory physician helped manage the patient's COPD and optimize his pulmonary function in preparation for an elective AAA repair. His AAA remained asymptomatic. Unfortunately, he presented acutely with lower abdominal pain. On examination, he was tachycardic and hypotensive (80/50). He was also in atrial fibrillation (AF) and dyspnoeic, and had a tender pulsatile abdominal mass.

The patient underwent emergency EVAR under LA and sedation (Fig. 1). Nine hours post-operation the patient was haemodynamically stable; his AF was controlled and he was comfortable on oxygen via a face mask. By the second day post-operation the patient was sitting up comfortably on room air. He was well enough to be discharged on the sixth post-operative day. He remained well and a follow-up CT angiogram at 6 months showed successful exclusion of the AAA (Fig. 2).

## DISCUSSION

The patient was diagnosed to have an infra-renal AAA (maximum diameter of 6 cm) when he presented with the ruptured TAA. As such, there was urgency to treat the AAA of this patient. However, even though he was discharged on the 10th post-operative day after TEVAR, his outpatient recovery was slow. He was coping at home but he remained to be dyspnoeic at rest and had very poor exercise tolerance.

Even though EVAR was a minimally invasive procedure, the risk of the operation (normally performed under GA) was considered too high at that stage. As his AAA was asymptomatic, efforts were made to improve his respiratory condition. The delay in the elective AAA repair resulted in the acute presentation of a ruptured AAA.

When the patient presented with the ruptured AAA, the patient was in shock. At that stage, the decision to intervene was not difficult as without intervention, the mortality would be 100%. Given his known medical history, the treating surgeon was hesitant to perform the emergency surgery under GA. After resuscitation it was decided to proceed with EVAR under LA.

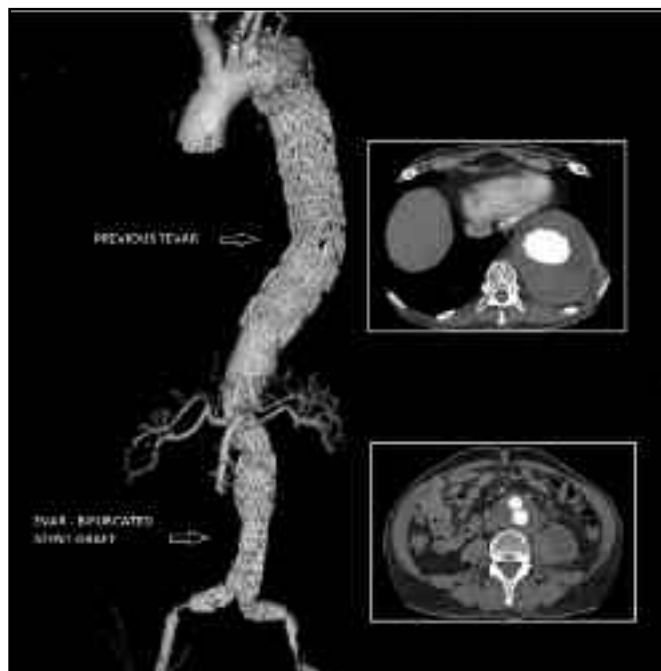
Most surgeons prefer to perform EVAR under GA. There was no randomised trial comparing LA to GA for EVARs. However, one prospective study<sup>1</sup> showed similar mortality rate between

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**Fig. 1:** (a) Pre-EVAR aortogram showing the ruptured AAA and blood in the retroperitoneum (b) Completion (post-EVAR) aortogram showing exclusion of the AAA.



**Fig. 2:** CTA at 6 months post-EVAR showing the successful treatment of the AAA and the TAA.

the two anaesthetic techniques, but a higher respiratory complication rate of 5% in GA to 0% in LA group (p-value <0.001).

Another study, a prospective study registry<sup>2</sup> across 164 vascular centres in Europe, looked at all EVAR done in a defined period of 7 years. They categorised them into high and low risk based on their ASA (American Society of Anesthesiologists) grades I-IV, and subsequently divided them into groups for GA, LA or regional anaesthesia (RA). They found that the LA group had a statistically significantly reduced length of hospital stay and ICU admissions in both the high and low risk categories. The high risk group also showed an increased systemic complication rate in the GA compared to the LA group (18.3% versus 9.0%, p=0.0128) in the 30 days post-operation.

Numerous other studies had shown a favourable trend toward performing EVARs under LA compared to GA with regards to post-operative complication rates and length of in-hospital and ICU stay in high risk patients. The uncomplicated post-operation course of our patient was consistent with these findings.

**CONCLUSION**

This case showed the importance of a quick but accurate diagnosis, appropriate timely resuscitation and a holistic assessment of a patient’s condition. Moreover, a comprehensive knowledge of available treatment options and the discernment to choose the most suitable option for each patient is essential to reduce post-operative mortality and morbidity.

**REFERENCES**

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