

CASE REPORT

A 103 Year Old Man With a Ruptured Abdominal Aortic Aneurysm

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Introduction: With wider use of stent grafts, treating nonagenarians with abdominal aortic aneurysm has become more common in Japan. This is the report of a 103 year old patient with a ruptured abdominal aortic aneurysm who successfully underwent emergency endovascular aortic repair. To the present authors' knowledge, this report describes the oldest patient treated for a ruptured abdominal aortic aneurysm with a successful outcome.

Report: A 103 year old man with ruptured abdominal aortic aneurysm was successfully treated by endovascular aortic repair. The post-operative course was uneventful, and he was discharged from the hospital on post-operative day 11. Two months later, in the outpatient clinic, the patient was doing well.

Conclusion: It is important that decisions concerning the operative indications for a ruptured abdominal aortic aneurysm in elderly patients are based not only on age, but also on a comprehensive pre-operative assessment, including consideration of the patient's activity of daily life and personal wishes, as well as the desires of family members.

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INTRODUCTION

With the popularisation of endovascular aortic repair (EVAR) for abdominal aortic aneurysm (AAA), elderly people with AAA can now undergo treatment less invasively than before. However, while several articles describing the outcomes of EVAR or open aortic repair for AAA in nonagenarians have been reported, the outcomes in patients aged ≥ 100 years remain unclear.^{1–3} Furthermore, the outcomes of ruptured AAA (RAAA) repair in patients aged ≥ 90 are under reported.⁴

This is the report of a 103 year old patient with a ruptured AAA who successfully underwent emergency EVAR. Although Lath et al.⁵ reported the case of a 101 year old female who successfully underwent surgery for open elective repair of a symptomatic AAA, to the present authors' knowledge, the present case is the oldest RAAA repair with a successful outcome reported in the literature.

Report

A 103 year old man with a medical history of hypertension who was able to perform activities of daily living almost

completely independently and with a degree of mild dementia was referred to the study hospital with a RAAA. His blood pressure on admission was 102/57 mmHg, with a heart rate of 68/min. A complete blood cell count showed a red blood cell count of $2.3 \times 10^6/\text{mL}$ and haemoglobin 7.7 g/dL, respectively. The estimated glomerular filtration rate was 23.0 mL/min/1.73 m², indicating acute renal failure. Blood gas analysis showed the lactate was 7.4 mmol/L and pH 7.207.

Contrast-enhanced computed tomography demonstrated a ruptured infrarenal AAA with a severe angulated neck, a diameter of 64 mm and a large amount of retroperitoneal hematoma extending above the right renal artery and into the pelvis (see Fig. 1 and 2). The patient was immediately brought to the operating room. EVAR was selected because the proximal neck length of 30 mm was enough to exclude the aneurysm despite the severely angulated neck. EVAR was performed using an ENDURANT II® (Medtronic World Medical, Sunrise, FL, USA) under general anesthesia. Completion angiography showed no evidence of endoleak. The postoperative course was uneventful, and he was discharged from the hospital on postoperative day 11 (see Fig. 3). Two months after surgery, the patient was doing well at the outpatient clinic.

DISCUSSION

In 2000, Japan was the only country with an average life expectancy over 80 years; however, in 2016, the number of such countries had reached 28, as the average life

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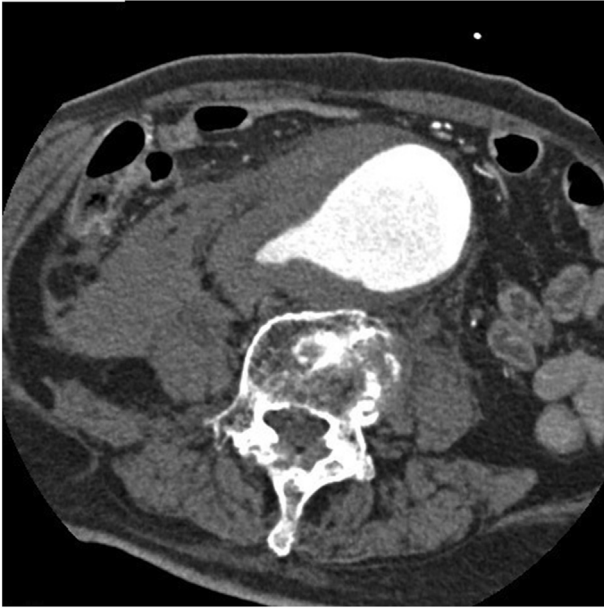


Fig. 1. Pre-operative contrast enhanced CT showing the RAAA in the axial view.

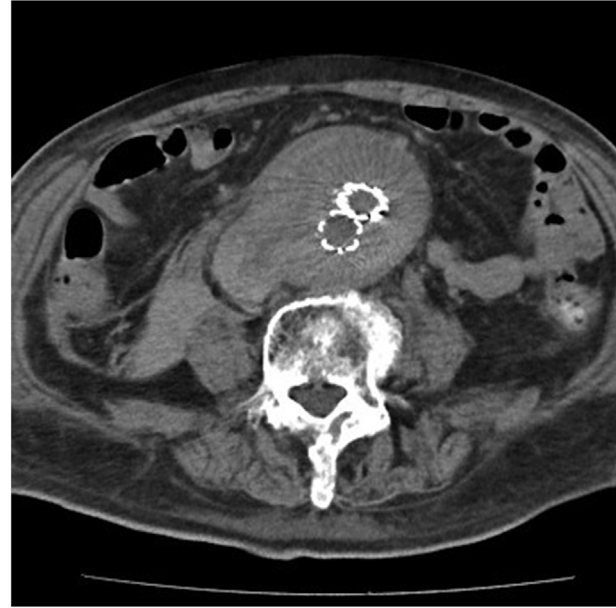


Fig. 3. CT on fifth day after EVAR showed that the peritoneal haematoma had decreased in size.



Fig. 2. Pre-operative three dimensional CT showing the infrarenal AAA with a severely tortuous proximal neck and the AAA rupture site.

expectancy is increasing around the world.⁶ The estimated life expectancy at 90 years of age is 4.3 years for Japanese men and 5.6 years for Japanese women, and that at 103 years of age is 1.4 years for Japanese men and 1.9 years for Japanese women.⁷ Although elective AAA repair may not be generally recommended for patients with a short life expectancy (less than two years), in ruptured AAA cases this rule may not apply. As the patient will die without surgery in ruptured AAA cases but can achieve pain relief resulting from the rupture by open or endovascular aortic repair,

patients with a short life expectancy and ruptured AAA should still be treated; however, this decision depends on the patient's background and personal wishes, as well as the desires of family members.

In the past decade, the outcomes of EVAR for AAA in nonagenarians have been described in several reports.^{1–3} Prenner et al.² reported that the freedom from all cause mortality in nonagenarians treated by elective EVAR for AAA was 83.3% at one year and 19.3% at five years, and the freedom from aneurysm related mortality was 87.5% at one year and 73.2% at five years.² Regarding the comparison of the outcomes of open surgery for AAA and EVAR in nonagenarians, Uehara et al.³ reported that the cumulative estimated one and three year survival rates were 90.0% and 48.0%, respectively, in the open repair for AAA group and 90.6% and 54.9%, respectively, in the endovascular repair for AAA group ($p = .51$).³ Although EVAR for AAA was shown to be superior in terms of the recovery, the results of conventional open repair were considered acceptable even in nonagenarians.³ Therefore, open repair for AAA remains an alternative for patients with contraindications to EVAR.³ However, the outcomes of treatment for RAAA in nonagenarians have rarely been reported. Sonesson et al.⁴ reported a high peri-operative mortality (approximately 50%) after surgery for RAAA in octo- and nonagenarians; however, if a patient survived the first 90 days, the long term survival after five years was high (>50%).⁴ Furthermore, the one, five, and ten year, long term survival (excluding all deaths up to 90 days) for RAAA in octo- and nonagenarians treated by EVAR was 86%, 47%, and 12%, respectively.⁴

In addition, regarding anaesthesia for EVAR, it is common to perform EVAR under general anaesthesia by exposure of both femoral arteries in Japan, as closure devices for EVAR are not covered by insurance. However, EVAR is sometimes

performed under local anaesthesia because of the risks associated with general anaesthesia in Japan. Furthermore, EVAR is performed under local anaesthesia when a patient is haemodynamically unstable, such as in rupture cases. In the present case, EVAR was performed under general anaesthesia because the patient was relatively stable haemodynamically.

Shan et al.⁸ evaluated the quality of life (QOL) in elderly patients (>75 years old) after elective or emergency EVAR or open repair. The QOL after EVAR and open repair declines early after surgery. There is a four to six week delay in mental health recovery and one the three month delay in physical health recovery. The QOL eventually returns to baseline and can be maintained in the long term. This finding supports the performance of AAA repair in elderly patients from a QOL perspective. In elderly patients, a balance must be achieved between the risks of intervention and the benefits of prolonging and maintaining the QOL.⁸ However, the outcome and QOL after EVAR or open aortic repair for AAA or RAAA in patients aged ≥ 100 years has not been reported. Regarding the age limit for AAA repair, Sonesson et al. suggested that the decision should be individualised, varying depending on ethical, political, and economic factors as well as the type of healthcare system in which the patient lives.⁹

There are benefits and drawbacks to treating AAA in patients aged ≥ 100 years; however, the suitability of this approach depends on the presence of symptoms, pre-operative activities of daily living, comorbidities, anatomical suitability for EVAR, life expectancy, and the will of the patient and their family, all of which should be considered when deciding on treatment. An age exceeding 100 years should not be immediate grounds not to treat.

CONCLUSION

It is important that decisions concerning the operative indications for a ruptured abdominal aortic aneurysm in elderly patients are based not only on age, but also on a comprehensive pre-operative assessment, including

consideration of the patient's activity of daily life and personal wishes, as well as the desires of family members.

CONFLICTS OF INTEREST

None.

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