

Case report

Rescued endovascular aneurysm repair using AFX-2 for ruptured, infected iliac aneurysm in disseminated Melioidosis

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Abstract

Endovascular aneurysm repair (EVAR) has become a viable alternative to open surgical repair for managing aortoiliac aneurysms, particularly in high-risk patients. Moreover, it is a treatment option for infected aortoiliac aneurysm. Some studies have shown a significantly higher early (30-90 days) mortality rate for EVAR compared with standard open surgical repair.

We reported a case of a 64-year-old male with a concealed ruptured infected iliac aneurysm associated with disseminated melioidosis, successfully treated with endovascular aneurysm repair by an AFX-2 endograft (Endologix, USA) device plus lifelong antibiotics at Phramongkutklao Hospital. The patient demonstrated good early and medium-term results, suggesting that AFX-2 endograft EVAR is a safe and effective option in selected cases. However, a long-term follow-up program is still necessary to monitor long-term efficacy and complications.

Keywords ● *Disseminated Melioidosis* ● *Endovascular aneurysm repair* ● *Infected aortoiliac aneurysm*

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รายงานผู้ป่วย

การรักษาโรคหลอดเลือดแดงใหญ่ในช่องท้องโป่งพองและติดเชื้อ ในผู้ป่วยเมลิออยโดสิสระยะแพร่กระจายโดยใช้หลอดเลือดเทียม AFX

ชนะรัตน์ โชคชัยสมุทร และ ธัชวิชญ์ อูราสุข

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บทคัดย่อ

Endovascular aortic aneurysm repair (EVAR) เป็นวิธีการผ่าตัดที่นิยมในการรักษาโรคหลอดเลือดแดง aorta และ iliac โป่งพอง ซึ่งสามารถใช้รักษาทดแทนการผ่าตัดแบบเปิด จากผลการศึกษาที่ผ่านมาพบว่าช่วยลดโอกาสการเกิดผลแทรกซ้อนหลังผ่าตัดได้ โดยเฉพาะอย่างยิ่งในผู้ป่วยที่มีความเสี่ยงสูง นอกจากนั้นแล้วในผู้ป่วยที่เป็นโรคหลอดเลือดแดง aorta และ iliac โป่งพองร่วมกับการติดเชื้อ ยังสามารถที่จะทำการรักษาโดยการผ่าตัด EVAR ได้ จากการศึกษาพบว่า อัตราการเสียชีวิตหลังทำการรักษาด้วย EVAR ในห้วง 30-90 วันน้อยกว่าการผ่าตัดแบบเปิดอย่างมีนัยสำคัญทางสถิติ

ผู้ประพันธ์ได้รายงานเคสผู้ป่วยชายอายุ 64 ปี ได้รับการวินิจฉัยโรคหลอดเลือดแดง iliac ด้านขวาโป่งพองแตกและมีการติดเชื้อ ซึ่งเกิดร่วมกับการติดเชื้อเมลิออยโดสิสระยะแพร่กระจาย ผู้ป่วยได้รับการรักษาโดยการผ่าตัด EVAR ด้วยหลอดเลือดเทียม AFX ร่วมกับการให้ยาปฏิชีวนะในระยะยาว ผลการรักษาในระยะสั้นและระยะกลางให้ผลที่ดี ซึ่งการรักษาหลอดเลือดแดง aorta และ iliac ที่โป่งพองและมีการติดเชื้อด้วย EVAR นั้นมีความปลอดภัยและให้ผลการรักษาที่ดี แต่อย่างไรก็ตามการตรวจติดตามหลังการผ่าตัดระยะยาวยังคงมีความจำเป็นเพื่อที่จะตรวจความเรียบร้อยของหลอดเลือดเทียมและผลแทรกซ้อนที่อาจเกิดขึ้นได้ในภายหลัง

คำสำคัญ ● เมลิออยโดสิสระยะแพร่กระจาย ● Endovascular aneurysm repair ● โรคหลอดเลือดแดงใหญ่ในช่องท้องโป่งพองและติดเชื้อ

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Introduction

Melioidosis, caused by *Burkholderia pseudomallei*, is a disastrous infectious disease endemic to Southeast Asia and Northern Australia. It has a variety of clinical presentations such as pneumonia, septicaemia, deep abscesses, and soft-tissue infections^{3,4} etc. Data from numerous studies consistently present a high mortality rate, which is estimated to range from 39% to 58%.^{5,6} Infected aortoiliac aneurysm is a rare presentation, found in only 1% of cases.⁷ These are recognized manifestations of disseminated melioidosis. It is challenging to diagnose and is associated with a high attributable mortality. The diagnosis should be considered in older patients who live in or have travelled to endemic areas and present with fever and abdominal or back pain.⁸ Early, comprehensive imaging, such as abdominal duplex ultrasound, computed tomography (CT) aortography, or magnetic resonance imaging (MRI), should be performed for diagnosis.⁹ Intravenous antibiotic administration is the main treatment for systemic infection, but antibiotics alone are not sufficient for infected aneurysms. Surgery is necessary to prevent rupture. Open surgical repair (OSR) remains the traditional operation. It consists of an occlusion of the aneurysm sac with aggressive debridement of the infected tissue, followed by revascularization, which carries significant risks, especially in critically ill patients. EVAR has emerged as a less invasive alternative, offering potential benefits in terms of reduced morbidity and mortality.¹⁰ EVAR is performed through small incisions at both common femoral arteries, followed by the insertion of a metallic framework covered with fabric material (a covered endograft) into the aneurysm (**Figure 1**). It inhibits the high-pressure arterial flow into the aneurysm sac, which is able to prevent a rupture event. A limitation of EVAR is its inability to eliminate necrotic tissue. However, many studies have shown that the survival rate at 3 months was higher for EVAR compared with standard open surgical repair.^{1,2} Nonetheless, some studies reports a higher recurrent infection rate after EVAR than after OSR (relative risk = 2.42:95%CI) in some study.¹¹

This case report presents the success to treat a ruptured, infected iliac aneurysm in a patient with disseminated melioidosis at Phramongkutklao hospital by EVAR. Our team selected the AFX-2 endograft (Endologix, USA) (**Figure 2**) for EVAR operation. The FDA approved this device in December 2022. It is a bifurcated, unibody covered endograft design that is superior to a modular design due to its ability to be implanted in a narrow aortic bifurcation. The five-year results of the randomized, multi-centre LEOPARD Trial showed no clinically significant difference

in aneurysm-related mortality, all-cause mortality, rupture, and secondary interventions when AFX-2 was compared with other cover endografts.¹²



Figure 1 Endovascular aortic aneurysm repair (EVAR)¹³



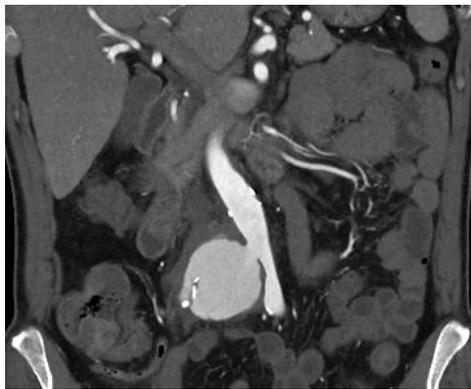
Figure 2 AFX-2 endograft

Case Report

A 64-year-old Thai construction worker presented with right lower quadrant abdominal pain for three months, accompanied by a noticeable mass and low-grade fever during the week preceding hospital admission. His medical history included hypertension, dyslipidaemia, and chronic heavy smoking. Physical examination showed a body temperature 38 degree Celsius and left lower quadrant tenderness without guarding. No abnormal skin lesions were detected.

Plain film acute abdomen series were unremarkable. Initial laboratory tests demonstrated leukocytosis with neutrophil predomination, normal kidney function test, and normal electrolyte levels. Further blood tests for infection revealed an elevated erythrocyte sedimentation rate (ESR) of 64 mm/hr. (reference range 0-15 mm/hr.) and a C-reactive protein (CRP) level of 136 mg/L (reference range 0-5 mg/L). Prior to antibiotic treatment, two blood culture specimens were collected. *Burkholderia pseudomallei* septicaemia was subsequently reported three days after initial management. A contrast-enhanced computed tomography (CT) scan of the abdomen showed a 7-cm concealed ruptured right common iliac artery (CIA) aneurysm, which contained a rim-enhancing cystic lesion and showed perilesional fat stranding. These CT imagings were

consistent with an infected ruptured right common iliac aneurysm. **(Figure 3)**. CT scan findings of infected aortic aneurysm reported in literature include saccular and multilobulate lesions (88-92%), periaortic rim enhancement 95%, periaortic fat stranding 94% and lymphadenopathy 62%.^{9,14} Furthermore, the spleen demonstrated multiple irregular, low-enhancing lesions with calcified components, consistent with splenic abscesses **(Figure 4)**. The results of investigations suggested disseminated melioidosis with an infected iliac aneurysm.



coronal view



axial view

Figure 3 Patient CT scan shows infected ruptured right common iliac aneurysm



coronal view



axial view

Figure 4 Splenic abscess, computerized tomography showed the multiple irregulars, low-enhancing lesions with calcified components

After investigation and resuscitation, an empirical antibiotic was prescribed. Because of a high surgical risk, endovascular surgery was chosen for emergency treatment. The patient underwent EVAR using the AFX-2 endograft system (**Figure 2**) combined with a right internal iliac artery Concerto coil (Medtronic, USA) embolization to exclude the infected right common iliac aneurysm. The lower abdominal pain symptoms were relieved, but the patient still complained of dull aching in the left upper quadrant of the abdomen with a high-grade fever. A CT scan was performed again 7 days after surgery. It presented a reduction in aneurysm size and multiple rim-enhancing lesions in the peri-iliac area (**Figure 5**). In contrast, the splenic abscess lesion did not respond to intravenous antibiotics.

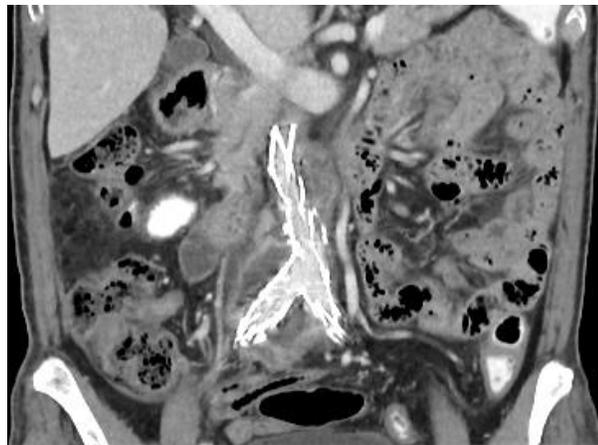


Figure 5 A reduction of thrombosed aneurysm size and multiple rim-enhancing lesions at the peri-iliac area

Then, an open splenectomy with peri-aortic abscess drainage was performed via a left subcostal incision and a right Gibson's incision for elimination of splenic lesions (**Figure 6**) and the right periaortic abscess (**Figure 7**). The tissue cultures from aneurysm and spleen were *Burkholderia pseudomallei*, which was susceptible to the previously administered antibiotics. After the drainage procedure, the systemic symptoms were dramatically relieved. The patient was discharged after 14 days of ceftazidime and continued lifelong oral co-trimoxazole (400:80, 1 tab oral three times daily)



Figure 6 A splenic abscess specimen

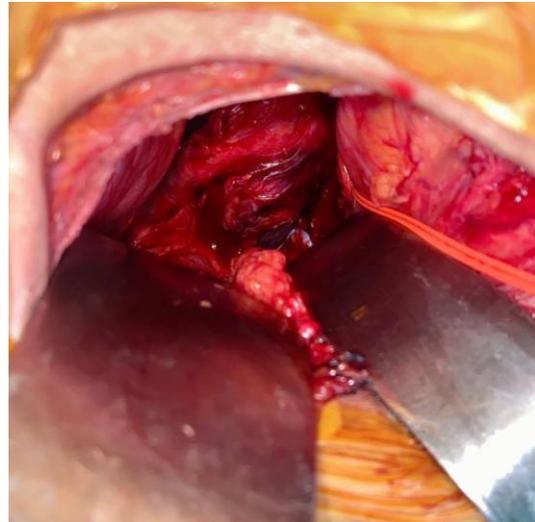


Figure 7 Right periaortic abscess

A routine follow-up program was performed normally. The patient had no fever or abdominal pain. The ESR and CRP values returned to normal levels. No surgical wound complications were detected. Annual computed tomography angiography (CTA) was performed. It demonstrated a reduction in the periaortic abscess was demonstrated. A third-year of CTA evaluation showed the absence of an infected aneurysm (**Figure 8**). Finally, the patient died 3 years after surgery due to advanced ampullary carcinoma.



Figure 8 A third year of CTA showed an absent of infected aneurysm

Discussion

Infected aortoiliac aneurysms are a challenging vascular disease, particularly when combined with a systemic infection, such as disseminated melioidosis caused by *B. pseudomallei*. Traditional open surgical repair has been the standard treatment but is associated with considerable perioperative morbidity and mortality, especially in high-risk patients. EVAR offers a minimally invasive alternative, reducing the physiological stress associated with open surgery. Many studies have shown that the survival rate at 3 months was higher for EVAR compared with standard open surgical repair.^{1,2} However, additional minimally invasive surgical drainage procedures are required in some cases. However, EVAR in infected aneurysms poses concerns regarding reinfection or persistent colonization of the endograft. Long-term outcomes remain under investigation, and further studies are needed to establish its efficacy and safety.

Conclusion

The AFX-2 endograft in EVAR presents a feasible and practical alternative to open surgical repair for ruptured, infected aortoiliac aneurysms, particularly in high-risk patients or those with disseminated infections. However, adjunctive procedures for infected tissue elimination must be combined for a good treatment result. Short to medium-term outcomes in this case are promising. However, a long-term follow-up program is still necessary to closely monitor efficacy, stent patency, and late complications.

Conflict of interest

All authors declare that they have no conflicts of interest.

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