Preliminary Report

Endovascular Abdominal Aortic Aneurysm Repair in High Risk Patients: Outcomes of Management

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Background: The concomitant cardiopulmonary disease precluded the elective repair for abdominal aortic aneurysm (AAA) with acceptable risk. The endovascular abdominal aortic aneurysm repair (EVAR) has become an alternative method for the treatment of AAA with high-risk comorbidities.
Objective: Evaluate the results of EVAR in high-risk patients with large AAA.
Material and Method: A prospective study of high-risk patients with large AAA and suitable morphology who underwent EVAR between August 2003 and August 2005 was conducted. The long-term outcomes were observed up to December 2006. The comorbidities, size of aneurysm, types of procedures, operative time, amount of blood loss and transfusion, length of postoperative stay in intensive care unit and hospital, postoperative complications and mortality were analyzed.
Results: Eight patients (7 males and 1 female) with the mean age of 71.4 years (range 66-83 years) were included in the present study. The comorbidities were six of compromised cardiac status, one of severe pulmonary disease and one of morbid obesity. The average size of aneurysm was 6.2 ± 0.64 centimetres. One patient also had large bilateral iliac artery aneurysms. Seven patients underwent EVAR with bifurcated aortic stent graft and one proceeded with aorto uni-iliac stent graft. Three patients underwent preoperative coil embolisation into internal iliac arteries when the distal landing zones at the external iliac arteries were considered. The mean estimated blood loss was 369cc and the mean blood transfusion was 0.88 units. There were no perioperative mortality, early graft occlusion, AAA rupture and open conversion in the present study. One patient had cardiac arrest due to upper airway obstruction but with successful treatment. Type II endoleak was observed in one patient and successfully treated by expectant management. One limb of bifurcated stent graft was occluded at the 5th month post EVAR and was successfully treated by artery bypass surgery at both groins. The 3-year primary graft limb patency was 87.5% (7/8). The survivals of patients at 1, 2 and 3 years were 100%, 100% and 87.5% respectively. The cause of death in one patient was not related to EVAR.
Conclusion: EVAR may be a safe and effective alternative to open AAA repair especially in high-risk patients.

Keywords: Abdominal aortic aneurysm, Endovascular repair, High-risk patients, Outcomes of management.

Due to the higher mortality rate of emergency repair of ruptured abdominal aortic aneurysm (AAA) compared with elective repair of non-ruptured AAA (more than 50% versus less than 5%), this disease

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should be treated before the occurrence of rupture[1-5]. Although elective open repair (OR) of AAA produces a low mortality rate, concomitant diseases such as coronary artery disease, chronic obstructive pulmonary disease and morbid obesity precluded this treatment with acceptable risk. In this situation, endovascular abdominal aortic aneurysm repair (EVAR) with the less invasive technique has become an alternative method for the treatment in those patients.

With the worldwide increase of EVAR for the treatment of AAA, the authors' institute has adopted this new therapeutic option for the treatment of this disease in unfit patients. The aim of the present study was to evaluate the results of EVAR in patients with AAA and high-risk comorbidities.

Material and Method

Between August 2003 and August 2005, the patients with high-risk comorbidities were selected to be treated by EVAR in the Vascular Surgery Unit, Department of Surgery and Department of Radiology, Faculty of Medicine Siriraj Hospital, Mahidol University. Elderly patients aged over 60 years who had a large ($\geq$ 5 cm in diameter) or rapidly expanding ($\geq$ 0.5 cm in 6 months) AAA with high-risk comorbidities were enrolled in the present study. High-risk criteria included American Society of Anesthesiology (ASA) classification 3 or 4[6] and the comorbidity variables of cardiac, or respiratory disease[7,8] and morbid obesity[9]. The patients with renal failure or serum creatinine > 2.0 mg/dL, short life-expectancy, major stroke, and active infection were excluded from the present study. Inclusion and exclusion criteria are summarized in Table 1 and Table 2.

The criteria of suitable AAA morphology for EVAR included the following[10].

1. Proximal neck (normal infra-renal aortic segment) with the minimum length of 15 mm.

2. Less than 60 degree angulation of the neck and aneurysmal body.

3. Intraluminal thrombus occupying less than of the aortic circumference and 2 mm. thickness.

4. Aortic neck diameter not greater than 28 mm without reversed cone shape.

5. Distal iliac arteries with the minimum length of 12-15 mm.

6. Absence of thrombus and ulceration of the iliac arteries.

The pre-operative assessment of AAA morphology was performed by computerized tomographic angiography (CTA) and conventional angiography for appropriate graft selection. The EVAR procedure was performed with angiographic C-arm fluoroscopy in the operating theater. The patient lay down on a radiolucent table with the exposed abdomen and both groins. Common femoral arteries were identified through bilateral groin incisions. Intraoperative aortography was performed by insertion of the catheter through a punctured wound on one side of the common femoral artery. This procedure provided the image of abdominal aorta, bilateral renal arteries and bilateral iliac arteries for the accurate positioning of the endovascular graft deployment. For bifurcated aortic stent graft deployment, the main body of the stent graft was inserted through an arteriotomy of the common femoral artery. The proximal end must be placed at the level just below the lowest renal artery orifice. The main body was completely deployed with its long distal limb landed at the common iliac artery and the short distal limb floating in the aneurysmal sac. Subsequently, another extended straight iliac stent graft was inserted through the arteriotomy of the contralateral common femoral artery to connect the short limb of the graft with the contralateral common iliac artery. The additional straight stent graft might be used to provide the optimal distal landing zone. After the stent graft was deployed in the appropriate position, a large balloon catheter was inserted and inflated in order to secure the proximal and distal landing zones of the stent graft and the junction between the short limb and the extended straight iliac stent graft. The position of stent graft and evidence of endoleak were examined by final intraoperative angiography before the closure of the arteriotomies and groin incisions. When the external iliac artery was considered the distal landing zone, the preoperative coil embolization of internal iliac arteries was used to prevent type I endoleak. Furthermore, should situations occur bilaterally, the interval coil embolizations of internal iliac arteries were performed to avoid the compromised ischemic problem of pelvic organs after EVAR.

Table 1. Inclusion criteria for EVAR

1. Asymptomatic large AAA (max.   > 5.5 cm)
2. Asymptomatic rapid expanding AAA
   (> 0.5 cm / 6 months)
3. High risk patient (severe associated disease)
4. Difficult anatomy for open repair:
   large iliac artery aneurysm
5. Age > 60 years

Table 2. Exclusion criteria for EVAR

1. Renal failure or serum creatinine > 2.0 mg/dL
2. Major stroke with bedridden
3. Short life expectancy
4. Previous pelvic and groin radiation
5. Active infection

For aorto uni-iliac stent graft deployment, the procedure was performed with the same manner as bifurcated aortic stent graft. However, the insertion of the extended iliac straight stent graft through the contralateral femoral arteries was not required due to the absence of the short limb of the aortic graft. The circulation of contralateral lower extremity was maintained by supplementary femoro-femoral bypass surgery after EVAR had been accomplished. Subsequently, either surgical ligation or insertion of endovascular occluder at the proximal part of contralateral common iliac artery was the final step in order to stop the reversed blood flow from this artery into the aneurysmal sac.

After the operation, the patient was transferred to an intensive care unit (ICU) for close monitoring of vital signs, cardiopulmonary status and adequacy of intravenous fluid therapy. The patient was allowed ambulation 48 hours after the procedure with stable monitoring. In the long term follow up, the patients were assessed by clinical examination and duplex ultrasonography every month during the first six months and every two months after this period. CTA of abdominal aorta was repeated every six months for the assessment of the size of aneurysmal sac, the position of endovascular stent graft and the evidence of endoleak. The following information including demographic data, indications for EVAR, AAA morphology, type of stent graft, duration of operative time and radiation time, amount of blood loss and transfusion, amount of exposure radiation, length of postoperative ICU and hospital stay and postoperative complications were recorded and analyzed.

Results

Between August 2003 and August 2005, the selected eight patients were successfully treated by EVAR. Table 3 summarizes the gender-age distribution, size of AAA, indications of procedure, types of treatment and complications in patients treated by EVAR. Of these patients, there were seven males and one female with the mean age of 71.4 years (range, 66-83 years). All patients had large asymptomatic AAA. Additionally, one of them had rapid expansion of AAA. The comorbidities precluding conventional surgery in these patients were six of poor cardiac status, one of poor pulmonary status, and one of morbid obesity. One patient had AAA associated with large bilateral iliac artery aneurysms. Open repair (OR) was initially attempted in this patient but terminated due to the difficult anatomy for surgery and unstable cardiac status during the dissection.

Seven patients underwent EVAR with bifurcated aortic stent graft and one proceeded with aorto uni-iliac graft. Among seven bifurcated aortic stent grafts, three of Excluder (WL Gore) and four of
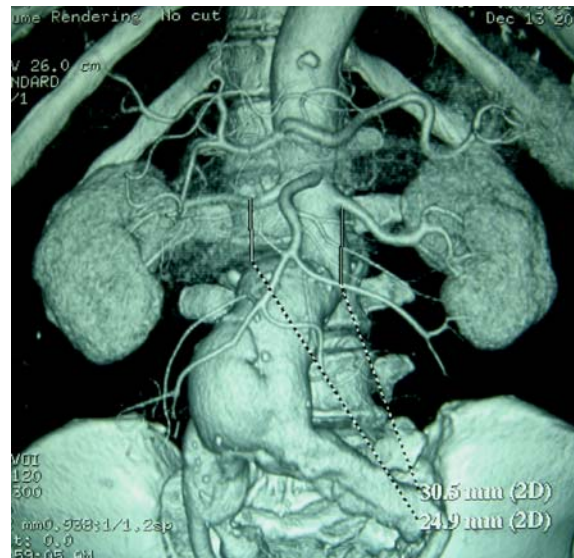
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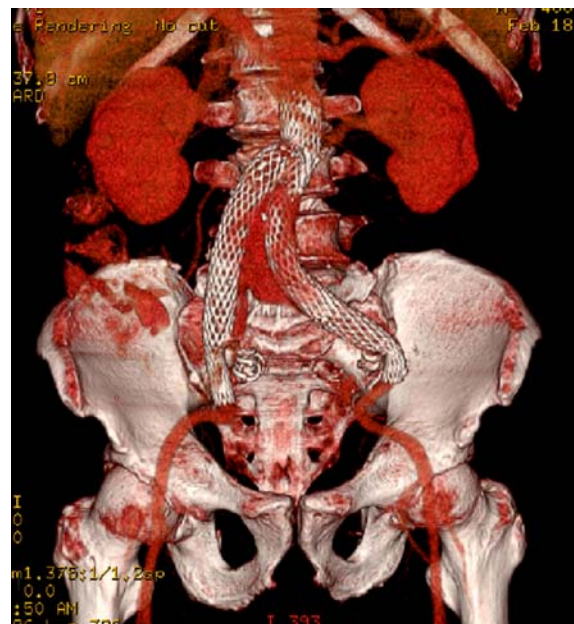
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Fig. 1 Bifurcated aortic stent graft for abdominal aortic aneurysm
A) Preoperative computerized tomographic angiography of abdominal aortic aneurysm
B) Postoperative computerized tomographic angiography after EVAR

Table 3. Gender-age distribution, size of aneurysm, indications, types of treatment and complications of asymptomatic AAA patients undergoing EVAR

Case No.	Sex	Age (yr.)	Maximal AAA diameter (cm)	Comorbidities and special considerations	Types of treatment	Complications
#1	M	66	5.7	CAD	Bifurcated graft Excluder (WL Gore)	None
#2	M	83	6.3	CAD, Paraplegia	Bifurcated graft Excluder (WL Gore)	1. Airway obstruction 2. Cardiac arrest 3. Late graft limb occlusion (at 5 months)
#3	F	70	6.9	Morbid obesity (BMI = 41.6 kg/m^2)	Bifurcated graft Excluder (WL Gore)	None
#4	M	69	5.0	1. CAD 2. Aorto iliac aneurysm with short segment of aortic aneurysm	1. Pre-EVAR coil embolization (bilaterally) 2. Bifurcated graft (Medtronic AVE)	Type II endoleak
#5	M	74	6.3	1. CAD 2. Large bilateral iliac aneurysms 3. Previous attempt open repair	1. Pre-EVAR coil embolization (bilaterally) 2. Aorto-uni-iliac graft (Medtronic AVE) 3. F-F crossover graft 4. Lt. CFA ligation	None
#6	M	72	6.0	1. COPD 2. Rapid expansion of AAA 3. Small iliac artery	1. Bifurcated graft (Medtronic AVE) 2. Trans-iliac artery cannulation 3. Lt. CFA endarterectomy	Intimal flap of Lt. CFA
#7	M	69	7.0	CAD	1. Pre-EVAR coil embolization (Unilaterally) 2. Bifurcated graft (Medtronic AVE)	None
#8	M	68	6.2	CAD	Bifurcated graft (Medtronic AVE)	None

CAD: Coronary artery disease, OR: Open repair, COPD: Chronic obstructive pulmonary disease, CFA: Common femoral artery, F-F: Femoro-femoral, BMI: Body mass index

AneuRx or Talent™ (Medtronic) were used in the procedure. The deployed aortic bifurcated stent graft is illustrated in Fig. 1. A Talent™ aorto uni-iliac stent graft was selected to treat one patient with AAA and large bilateral iliac artery aneurysms. The deployed aorto uni-iliac stent graft is shown in Fig. 2. Three patients underwent preoperative coil embolization in the internal iliac artery. Two patients required interval
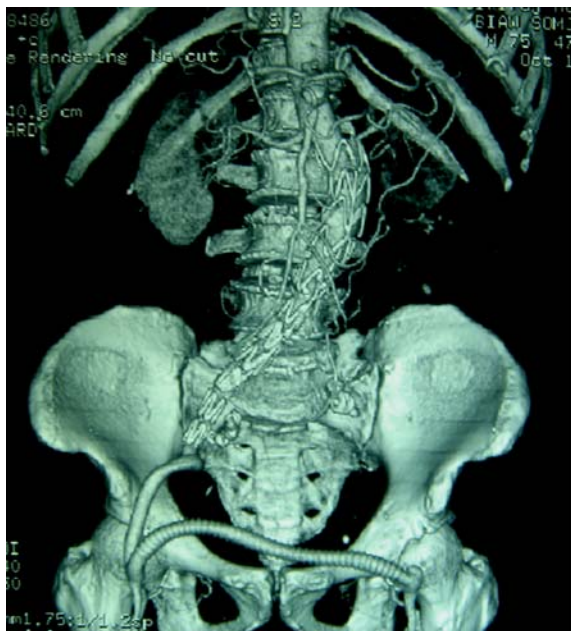
Fig. 2 Aorto uni-iliac stent graft and femoro-femoral cross-over graft for abdominal aortic aneurysm and large iliac artery aneurysm

bilateral internal iliac artery coil embolization while one patient required this procedure only in one side.

The mean operative time and radiation time were 275 minutes (range, 190-415 minutes) and 63.5 minutes (range, 28-172 minutes) respectively. The average dosage of radio-opaque contrast media used in each procedure was 210 cc (range, 150-300 cc) and the average dosage of exposed radiation was 74.6 Rad. (range, 38.6-172 Rad.). The mean estimated blood loss was 369 cc (range, 100-500 cc) and the mean blood transfusion was 0.88 unit (range, 0-3 units). The mean

length of postoperative stay were 4.1 days (range, 1-20 days) in ICU and 17.8 days (range, 9-37 days) in hospital.

The complications of EVAR and their management are demonstrated in Table 4. There are no perioperative mortality, early graft limb occlusion, early AAA rupture and open conversion in the present study. One patient developed cardio-pulmonary arrest due to upper airway obstruction from excessive secretion on the second postoperative day after extubation (Table 3). He was successfully treated by cardio-pulmonary resuscitation, tracheostomy with prolonged postoperative stay in the intensive care unit and hospital. Endoleak was detected in one patient who had persistent pulsatile AAA on the first postoperative day (Table 3). Postoperative angiography was urgently performed to confirm the evidence of endoleak. Balloon angioplasty was immediately applied at the proximal landing zone, modular junction of short limb and distal landing zone in order to obliterate type I and type III endoleak. As the persistent visualization of endoleak was demonstrated after this procedure, the diagnosis of endoleak type II was established. This complication was successfully treated by expectant management.

Up to December 2006, the mean follow up period was 24 months (range, 16-40 months). Graft migration, AAA sac enlargement and AAA rupture were not detected during the present study. One patient with bifurcated aortic stent graft placement developed acute ischemia of his left leg due to acute graft limb occlusion at the fifth month following the operation (Table 3). Subsequently confirmed by CTA, this problem was successfully treated by right external iliac artery to left superficial femoral artery bypass with externally supported PTFE graft. This patient expired due to

Table 4. Early and late complications of EVAR in 8 patients

| Complications	No. of patients	Management
30-day peri-operative death	0	-
Cardiopulmonary arrest	1 (1/8)	CPR, tracheostomy, and prolonged ICU and hospital stay
Early endoleak (Type II)	1 (1/8)	Expected management
Early ruptured AAA	0	-
Late ruptured AAA	0	-
AAA sac enlargement	0	-
Graft migration	0	-
Graft limb occlusion (Late)	1 (1/8)	1. Confirmed diagnosis by contrast-enhanced CT
		2. Rt. EIA to Lt. SFA bypass with externally supported PTFE graft

CPR: Cardiopulmonary resuscitation, CT: Computerized tomography, EIA: External iliac artery, SFA: Superficial femoral artery, PTFE: Polytetrafluoroethylene

ischaemic heart disease at the 26th month post EVAR with the good patency of aortic graft and ilio-femoral crossover graft.

Three year primary graft limb patency was 87.5% (7/8) (Fig. 3). The survival of patients in the present study at 1, 2, and 3 years was 100%, 100%, and 87.5% respectively (Fig. 4). The cause of death in one patient was not related to EVAR.

Discussion

Open repair (OR) has been the standard operation for AAA since the first successful aortic graft replacement of an AAA was published by Dubost et al in 1952[11]. The perioperative mortality of elective OR in individual centers of excellence was one-tenth of emergency OR for ruptured AAA (only 1% to 5%[1-3] versus 40% to 50[4,5]). With the development of surgical
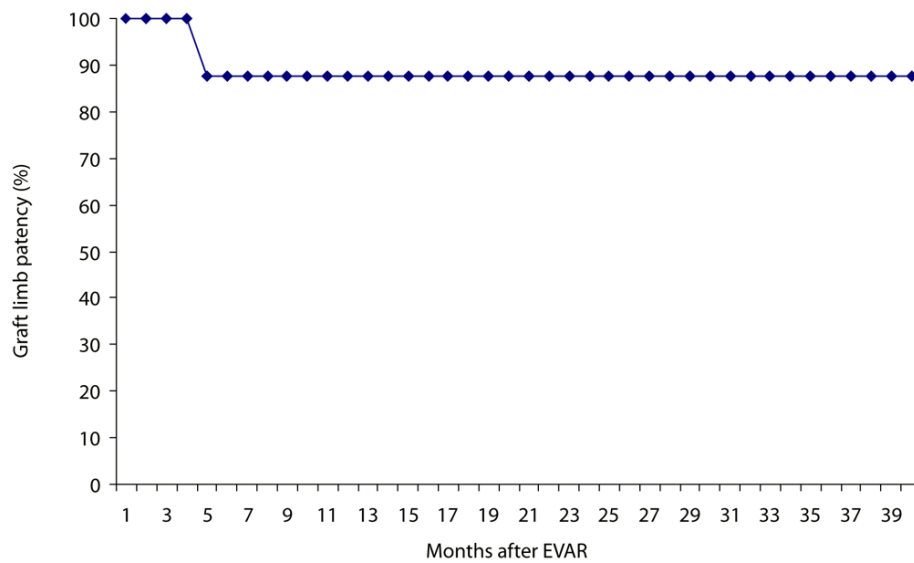
Fig. 3   Life-table analysis of graft limb patency post EVAR
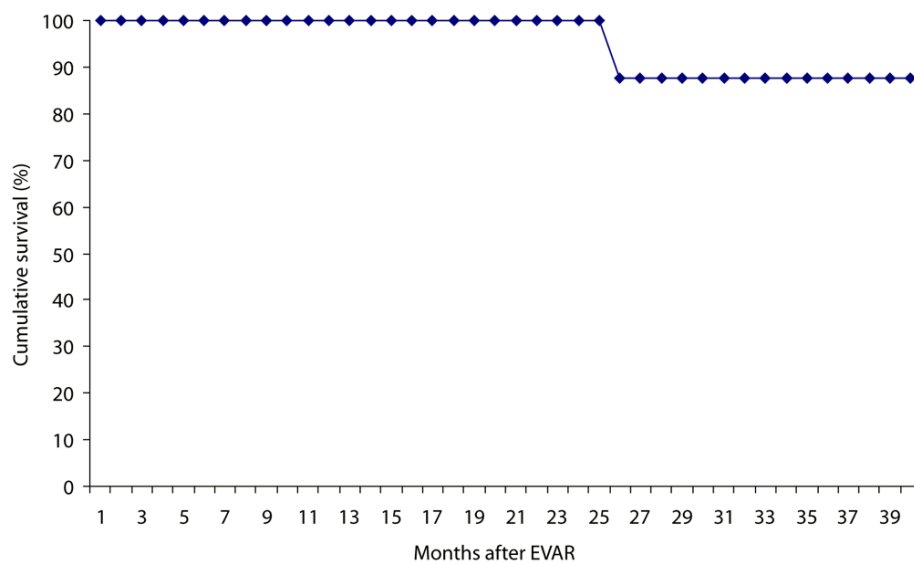
Fig. 4   Life-table analysis of survival post EVAR

techniques, prosthetic vascular grafts, anesthesia, and perioperative cardiopulmonary monitoring, the average mortality rate of elective OR from 64 studies was 5.5%[12]. In the past, patients with high-risk co-morbidities and unsuitable for OR were eventually treated by expectant management. EVAR provided an alternative method of treatment for these patients. After Parodi et al[13,14] reported their achievement in AAA treatment with transfemoral intraluminal graft implantation in 1991, the number of patients with AAA treated by the endovascular approach has been increasing. Currently, more than half of the AAA patients are being treated by EVAR in some medical centers[15]. The advantages of EVAR compared with OR are the reduction of postoperative pain, recovery period, operative mortality, blood transfusion, ICU and hospital stay due to the smaller surgical incision with minimally invasive technique. This procedure is also applicable in patients with previous abdominal surgery[16-20]. Therefore, EVAR was selected for the treatment of AAA in eight unfit patients that yielded favorable results. Three patients with the difficult distal landing zones in the external iliac arteries instead of the common iliac arteries were successfully treated with preoperative coil embolisations in the internal iliac arteries to prevent type I endoleak. Although there were several reports of ischaemic consequences such as buttock necrosis, lower limb neurological deficits, ischaemic colitis, bladder necrosis and buttock claudication following bilateral internal iliac artery exclusion[21-26], these serious morbidities were absent in the present study, similar to that of Mehta et al[27]. The 30 day perioperative mortality of the present series was comparable with a large randomized controlled trial of the patients unfit for OR managed by either EVAR or no intervention in the British Endovascular Aneurysm Repair Trail 2, (EVAR trial-2)[28].

The mean operative time of EVAR in the present study was not significantly shorter than OR in the authors' experience (275 minutes versus 300 minutes). However, this result can be improved when the procedure is carried out in a larger number of AAA patients by more experienced teams. Blood transfusion was markedly reduced in EVAR compared with OR in the authors' experience (1 unit versus 3 units). Furthermore, seven patients had an uneventful recovery in the postoperative period with full ambulation on the third postoperative day. This result confirms that EVAR is less invasive than OR. A short period of cardiac arrest after extubation in one patient was considered not directly related to the EVAR procedure. Type II

endoleak was detected only in one patient and successfully treated with expectant management for 6 months. This minor complication was commonly found after EVAR procedure due to the continuous blood flow from lumbar and inferior mesenteric arteries into the aneurysmal sac and eventually subsided without any intervention procedure.

In the present study, the disadvantages of EVAR were the high cost of endovascular stent graft, the exposure of nephrotoxic contrast media and the requirement of repeated CTA for the assessment of long term outcome. However, in a 3-year follow up post EVAR, there was no significant complication due to this procedure. The present result was also comparable with the series of EVAR trial-2[28]. The success of treatment depended on the intensive patient assessment, the accurate measurement of AAA morphology by CTA and convention angiography, the appropriate endovascular stent graft selection and the cooperation among vascular surgeons, radio-interventionists, and vascular anesthetists. The effectiveness of EVAR requires long term follow up in a larger series of patients undergoing this procedure. However, the comparative study among OR, EVAR, and non-operative management in unfit AAA patients is necessary to clarify the real benefit of this procedure.

Conclusion

EVAR may be a safe and effective alternative to open AAA repair in especially high-risk patients. EVAR should be considered to be used in high-risk asymptomatic AAA patients, good aneurysmal morphology, normal renal function, more than a 5 year life expectancy with good quality and absence of active infection.

Acknowledgments

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การสอดใส่หลอดเลือดเทียมที่มีขดลวดถ่างคาเพื่อการรักษาโรคหลอดเลือดใหญ่ของช่องท้องโป่งพองในผู้ป่วยที่มีปัจจัยเสี่ยงสูง

ประมุข มุทิรางกูร, จุฑาเกียรติ เครือตราชู, ปรีชา โอภาสานนท์, วลัยลักษณ์ ชัยสูตร, เฉนียน เรืองเศรษฐกิจ, ชุมพล ว่องวานิช, ทนงชัย สิริอภิสิทธิ์, ณัฐวุฒิ เสริมสาธนสวัสดิ์, คามิน ชินศักดิ์ชัย, อรวรรณ พงษ์รวีวรรณ

วัตถุประสงค์: ศึกษาผลการรักษาหลอดเลือดแดงใหญ่ของช่องท้องโป่งพองในผู้ป่วยที่มีปัจจัยเสี่ยงสูงโดยวิธีการสอดใส่หลอดเลือดเทียมที่มีขดลวดถ่างคาผ่านทางหลอดเลือดแดงบริเวณขาหนีบ

วัสดุและวิธีการ: การศึกษาได้ดำเนินการระหว่างเดือนสิงหาคม พ.ศ. 2546 ถึงเดือนธันวาคม พ.ศ. 2549 ในผู้ป่วยที่มีหลอดเลือดแดงใหญ่ของช่องท้องโป่งพองที่มีขนาดเส้นผ่าศูนย์กลางมากกว่า 5 เซนติเมตร และมีโรคประจำตัวที่เป็นปัจจัยเสี่ยงสูงต่อการผ่าตัดใหญ่บริเวณช่องท้อง การสอดใส่หลอดเลือดเทียมที่มีขดลวดถ่างคาเข้าไปในหลอดเลือดแดงที่โป่งพองนี้ได้กระทำผ่านทางหลอดเลือดแดงบริเวณขาหนีบ การศึกษาได้ทำการวิเคราะห์ผลการรักษาทางด้านความปลอดภัยและประสิทธิภาพของการรักษาด้วยวิธีนี้

ผลการศึกษา: ในการศึกษาได้มีผู้ป่วยจำนวนทั้งสิ้น 8 รายเป็นเพศชาย 7 รายและเพศหญิง 1 ราย โรคที่เป็นปัจจัยเสี่ยงต่อการผ่าตัดใหญ่บริเวณช่องท้องที่พบในผู้ป่วยกลุ่มนี้ ได้แก่ โรคหัวใจขาดเลือด 6 ราย ถุงลมโป่งพองขั้นรุนแรง 1 ราย และโรคอ้วนมาก 1 ราย หลอดเลือดแดงใหญ่ของช่องท้องส่วนที่มีการโป่งพองมีความยาว ของเส้นผ่าศูนย์กลางโดยเฉลี่ย 6.2 ± 0.64 เซนติเมตร ผู้ป่วย 1 รายมีการโป่งพองของหลอดเลือดแดงอิลิแอคร่วมด้วย มีผู้ป่วยจำนวน 7 รายได้รับการผ่าตัดสอดใส่หลอดเลือดเทียมที่มีขดลวดถ่างคาชนิด 2 ขา และผู้ป่วย 1 รายได้รับการ สอดใส่ หลอดเลือดเทียมที่มีขดลวดถ่างชนิด 1 ขา นอกจากนี้ผู้ป่วย 3 รายได้รับสอดใส่ขดลวดเพื่อให้เกิดการอุดตันภายในหลอดเลือดแดงอินเทอร์นัล อิลิแอค เนื่องจากตำแหน่งของปลายขาของหลอดเลือดเทียมต้องวางมา ถึงหลอดเลือดแดงเอ็กซ์เทอร์นัลอิลิแอค การรักษาวิธีนี้มีการเสียเลือดโดยเฉลี่ยเพียง 369 ลูกบาศก์เซนติเมตร และจำเป็นต้องให้เลือดโดยเฉลี่ยเพียง 0.88 ยูนิต ในการศึกษานี้ผู้ป่วยทุกรายได้รับการสอดใส่หลอดเลือดเทียม เป็นผลสำเร็จทุกรายโดยไม่จำเป็นต้องเปลี่ยนวิธีการรักษาเป็นการผ่าตัดใหญ่บริเวณช่องท้อง และไม่มีการเสียชีวิตในผู้ป่วยกลุ่มนี้ ภาวะแทรกซ้อนที่สำคัญ 3 ประการ ประการแรกคือ การหยุดเต้นของหัวใจชั่วขณะร่วมกับภาวะอุดตันของทางเดินหายใจส่วนบนเนื่องจากเสมหะเหนียวข้นในผู้ป่วย 1 ราย ซึ่งได้รับการรักษาทันทีเป็นผลสำเร็จ ประการที่สองคือ การรั่วของเลือดเข้ามาในหลอดเลือดแดงส่วนที่มีการโป่งพองชนิดที่ 2 ในผู้ป่วย 1 ราย ซึ่งสามารถหยุดได้เองในเวลาต่อมา และประการที่สามคือ การอุดตันของขาข้างหนึ่งของหลอดเลือดเทียมในผู้ป่วย 1 ราย ภายหลังการรักษา 5 เดือน ทำให้เกิดการขาดเลือดอย่างรุนแรงของขาข้างนั้น ซึ่งได้รับการแก้ไขเป็นผลสำเร็จโดยการผ่าตัด เปลี่ยนทางเดินหลอดเลือดแดง ในการศึกษามีผู้ป่วย 1 รายเสียชีวิตจากภาวะหัวใจขาดเลือดภายหลังการรักษาเป็นเวลา 26 เดือน โดยภาพรวมของผลการรักษานี้ พบว่าความคงทนของหลอดเลือดเทียมที่ใช้ในการรักษาโรคนี้ในช่วงเวลา 3 ปีอยู่ที่ร้อยละ 87.5 อัตราการอยู่รอดของผู้ป่วยภายหลังการรักษาในระยะเวลา 1 ปี 2 ปี และ 3 ปี คิดเป็นร้อยละ 100 100 และ 87.5 ตามลำดับ สาเหตุของการเสียชีวิตไม่เกี่ยวข้องกับวิธีการรักษานี้

สรุป: ในการศึกษานี้พบว่า การรักษาหลอดเลือดแดงใหญ่ของช่องท้องโป่งพองโดยวิธีการสอดใส่หลอดเลือดเทียมที่มีขดลวดถ่างคาในผู้ป่วยที่มีปัจจัยเสี่ยงสูง จัดเป็นการรักษาที่มีความปลอดภัยและมีประสิทธิภาพช่วยลดอัตราตายจากการรักษาโรคนี้โดยวิธีการผ่าตัดใหญ่บริเวณช่องท้อง