การรักษาโรคหลอดเลือดโป่งพองในช่องท้องชิดหลอดเลือดแดงไตโดยวิธีการผ่าตัดสอดสายสวนและอุดหลอดเลือดโป่งพองด้วยสารสังเคราะห์ร่วมกับหลอดเลือดเทียมคู่ขนาน: กรณีรายงานการศึกษาในผู้ป่วย 1 ราย

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Endovascular Aneurysm Sealing System Combination with Chimney Grafts for Treatment of Juxtarenal Abdominal Aortic Aneurysms: A Case report

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วัตถุประสงค์: เพื่ออธิบายการรักษาโรคหลอดเลือดแดงเอออร์ติคโป่งพองในช่องท้องที่ชิดเส้นเลือดแดงไตโดยวิธีการผ่าตัดสอดสายสวนและอุดหลอดเลือดโป่งพองด้วยสารสังเคราะห์ร่วมกับหลอดเลือดเทียมคู่ขนาน

วัสดุและวิธีการ: ผู้ป่วยชายอายุ 67 ปีได้รับการวินิจฉัยว่าเป็นโรคหลอดเลือดแดงเอออร์ติคโป่งพองในช่องท้องชิดเส้นเลือดแดงไตไม่สามารถรับการรักษาโดยวิธีการผ่าตัดสอดสายสวนชนิดมาตรฐานได้ จึงได้รับการรักษาโดยวิธีการผ่าตัดสอดสายสวนและอุดหลอดเลือดโป่งพองด้วยสารสังเคราะห์ร่วมกับหลอดเลือดเทียมคู่ขนาน

ผลการรักษา: การผ่าตัดใช้เวลา 305 นาที เวลาของการใช้เครื่องฉายรังสี 80 นาที ไม่พบ endoleak ผลการเอกซเรย์คอมพิวเตอร์หลอดเลือดแดงหลังการรักษาพบหลอดเลือดเทียมคู่ขนานไปที่ไตข้างซ้ายพับงอเล็กน้อยแต่มีกระแสเลือดไปไตซ้ายได้ดี และพบ endoleak type Ib ที่หลอดเลือดแดง common iliac ข้างซ้าย แพทย์ให้การรักษาสำเร็จโดยไม่มีภาวะแทรกซ้อนใด โดยผู้ป่วยรายนี้เป็นผู้ป่วยคนแรกของประเทศไทยที่ได้รับการวินิจฉัยว่าเป็นโรคหลอดเลือดแดงเอออร์ติคโป่งพองในช่องท้องชิดหลอดเลือดแดงไตและได้รับ

Case Report: A 67-year-old man was diagnosed with 6-cm juxtarenal abdominal aortic aneurysm. Because of anatomical consideration of short proximal landing zone, standard endovascular aneurysm repair (EVAR) was inappropriate. A custom-made fenestrated graft was not recommended from the experts. The patient rejected open repair. The procedure was undertaken using EVAS with 2 chimney grafts for extending landing zone.

Result: The procedure time was 305 minutes and 80 minutes for fluoroscopy time. Final angiography showed completed exclusion of aneurysm with good blood flow to visceral branches. Computed tomography angiography (CTA) before discharge showed mildly kinked at middle part of left renal chimney stent with good blood flow and type Ib endoleak at left common iliac artery. Final angiogram showed aneurysm exclusion by polymer and both renal arteries were patent. In-hospital renal function was normal and the patient was discharge uneventfully.

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รักษาโดยวิธีนี้

สรุป: การรักษาโรคหลอดเลือดโป่งพองในช่องท้องชิดหลอดเลือดแดงไตโดยวิธีการผ่าตัดสอดสายสวนและอุดหลอดเลือดโป่งพองด้วยสารสังเคราะห์ร่วมกับหลอดเลือดเทียมคู่ขนานสามารถรักษาได้ และจำเป็นต้องมีข้อมูลเพิ่มเติมในอนาคต

Conclusion: The use of EVAS with chimney graft treating juxtarenal abdominal aortic aneurysm is feasible and needs more further data.

Keywords: juxtarenal abdominal aortic aneurysm, endovascular aneurysm sealing system, chimney grafts, parallel grafts, endobags, endoleak

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Introduction

The chimney technique using the parallel grafts has been one of alternative treatment for juxtarenal abdominal aortic aneurysm by using endograft deployment at the visceral ostia combined with parallel graft. By this technique may be consequence of endoleak via the gutter between endograft and parallel graft in short- and mid-term clinical outcomes[1-11]. Endovascular aneurysm sealing system (EVAS) with the Nellix system (Endologix, Irvine, CA, USA) is an alternative endovascular treatment of abdominal aortic aneurysm (AAA) by using polymer filled endobags with two balloon-expandable stents and combined with parallel grafts for treating juxtarenal abdominal aortic aneurysm. The endobags may prevent of gutter formation by sealing the space between endograft and chimney stents[11]. This report shows the early experience of treating juxtarenal abdominal aortic aneurysm by EVAS and chimney grafts, the first published case in Thailand.

Case Report

A 67-year-old man with history of smoking and chronic obstructive pulmonary disease was diagnosed with 6-cm juxtarenal abdominal aortic aneurysm (Fig. 1A, 1B). Because of anatomical consideration of short proximal landing zone. The standard endovascular aneurysm repair (EVAR)[12] was not recommended. A custom-made fenestrated graft was not recommended from the experts. The patient rejected open repair.

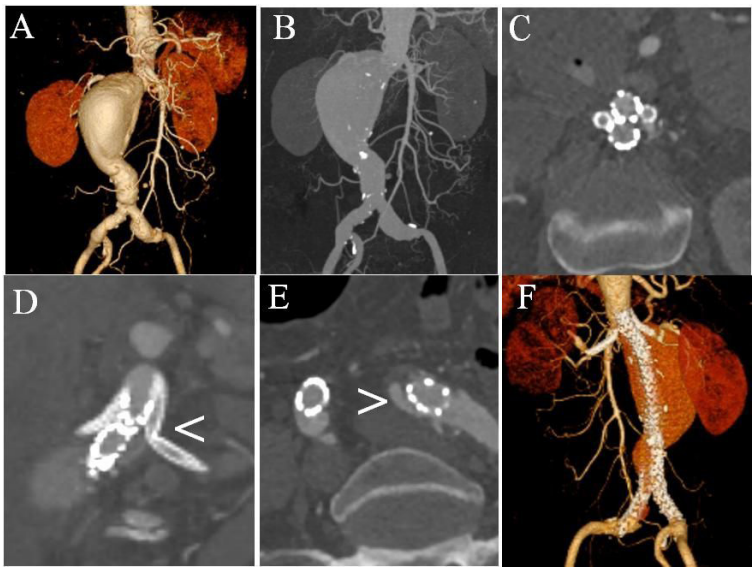

Figure 1 (A, B) Preoperative imaging shows 6-cm juxtarenal abdominal aortic aneurysm. Follow-up computed tomography angiography after 6 weeks shows (C) good proximal landing zone sealing, no sign of type Ia endoleak. (D) Kinked left renal artery chimney graft, but shows good blood flow. (E) Type Ib endoleak at left common iliac artery. (F) A 3-dimentional reconstruction showing Nellix stents and chimney grafts.

The treatment options were discussed with the patient. The patient was informed the possibility of using chimney grafts to increase the length of proximal landing zone combinding with EVAS. He gave informed consent for the off-label use of EVAS with chimney grafts.

The patient was operated under general anesthesia and antibiotic prophylaxis. The procedure was performed by cardiovascular surgeon and interventional radiologist. A percutaneous puncture was made at the common femoral arteries and two Proglide (Abbott Vascular, Abbott Park, IL, USA) closure devices deployed. The 8 mm Dacron graft conduit was performed via right subclavian artery. Two long 8.5 Fr sheaths were inserted to descending aorta. Subsequently two stiff wire were inserted and placed at descending aorta through both femoral arteries with calibrated catheters. Angiography was performed for the length of both main stents (180 mm both side). Both renal arteries were canulated and two Advanta V12 ballon-expandable covered stents were place in both sides of renal arteries (5x59 mm for both renal arteries).

Two Nellix graft (180 mm) were inserted through the common femoral arteries. Angiography was performed for checking the position all stents. All 4 stent-graft were simultaneously deployed, two Nellix stents were deployed just distal to superior mesenteric artery, followed by deployment of both chimney grafts. The endobags were pre-filled with saline solution with contrast 145 mL at pressure of 180 mmHg. Angiography showed no endoleak (Fig. 1C) and complete exclusion of aneurysm. The saline solution with contrast were removed. The polymer was filled to endobags 145 mL at pressure of 180 mmHg. The balloons of both chimney graft were inflated during the entire filling of endobags, for prevention of collapse of chimney grafts. The secondary filling of endobags used 21 mL of polymer. Final angiography showed completed exclusion of aneurysm, patent renal, superior mesenteric arteries and no endoleak.

The procedure time was 305 minutes and 80 minutes for fluoroscopy time. The patient was admitted in intensive care unit for 4 days uneventfully, 11 days of hospital stay. CTA before discharge showed mildly kinked at middle part of left renal chimney stent with good blood flow (Fig. 1D), and type Ib endoleak at left common iliac artery (Fig. 1E), aneurysm sac was seal and no stents migration. The renal function was normal.

Discussion

This case demonstrates the feasibility of using endovascular aneurysm sealing system (EVAS) and chimney grafts to treat juxtarenal abdominal aortic aneurysm by cardiovascular surgeon and interventional radiologist. This procedure showed the potential for the patients with unsuitable for fenestrated graft candidate. We prefer to use endovascular aneurysm sealing system and chimney grafts (chEVAS) than standard EVAR with chimney graft. By chEVAS may reduce risk of type Ia endoleak from the gutter formation between standard EVAR stent and chimney graft by endobags filling up the space between Nellix stents and chimney graft. This conformable polymer-filled endobags may provide a good and durable seal around Nellix stents, chimney grafts and aortic wall (Fig. 1F).

The kinking of left renal artery chimney grafts might from anatomical challenge with acute angulation (> 110°) of left renal artery. Type Ib endoleak might from filling pressure for endobags should be around or more than 180 mmHg for good sealing of left common iliac artery, the authors considered conservative treatment for this endoleak with the close follow-up.

Conclusion

Using endovascular aneurysm sealing system (EVAS) and chimney grafts offers an alternative treatment for patients with juxtarenal abdominal aortic aneurysm which is unsuitable for fenestrated graft or open surgery and feasible for the center with experience of Nellix stents. More presents on chEVAS in juxtarenal abdominal aortic aneurysm are necessary.

Declaration of Conflicting Interests

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