

MO-1 Clinical Outcomes of Endovascular Therapy for Isolated Popliteal Artery Disease with Each Device -SUPERA vs. Drug-coated Balloon Angioplasty vs. Standard Percutaneous Transluminal Angioplasty-

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【What's known?】

Background: Popliteal artery disease is challenging anatomical lesion for endovascular therapy (EVT) because of accelerated restenosis and high rates of stent fractures and occlusions. Recently, we have learnt to use new devices which improved the results in this anatomical territory such as drug-coated balloon (DCB) and new interwoven self-expanding nitinol stent, SUPERA. In Japan, clinical outcomes of each device for isolated popliteal artery disease were uncertain.

【What's new?】

Methods: 150 patients/160limbs (102males, mean age 72 ± 11 years) were treated by EVT with SUPERA (11patients, 14limbs), DCB angioplasty (21patients, 21limbs) or standard percutaneous transluminal angioplasty (PTA) (118patients, 125lesions) for isolated popliteal artery disease between April 2007 and February 2021. The primary outcome was primary patency at 12months after EVT. Also, we estimated freedom from clinically driven target lesion revascularization (CD-TLR) and amputation free survival at 12months after EVT. Results: At 12 months, primary patency was significantly highest among patients undergoing EVT with SUPERA (SUPERA:91% vs. DCB:71% vs. PTA:57%, $p=0.04$, log-rank). Also, Freedom from CD-TLR showed similar tendency (SUPERA:91% vs. DCB:72% vs. PTA:66%, $p=0.10$, log-rank). AFS at 12 months was similar in group (SUPERA:84% vs. DCB:95% vs. PTA:88%, $p=0.59$, log-rank). Conclusions: For patients with isolated popliteal artery disease, SUPERA may be therapeutic option to avoid restenosis.

MO-2 The Clinical Impact of high and low-dose Paclitaxel Drug-Coated balloon on Patients with Intermittent Claudication or chronic limb-threatening ischemia

○Kunihiko Nishian¹⁾, Masashi Fukunaga¹⁾, Machiko Nishimura¹⁾, Reiko Fujiwara¹⁾, Tsuyoshi Nakata¹⁾, Tomofumi Tsukizawa³⁾, Naoko Higashino²⁾, Taku Toyoshima²⁾, Yosuke Hata²⁾, Masahiko Fujihara³⁾, Osamu Iida²⁾, Daizo Kawasaki¹⁾
¹⁾ Morinomiya Hospital, ²⁾ Kansai Rosai Hospital, ³⁾ Kishiwada Tokushukai Hospital

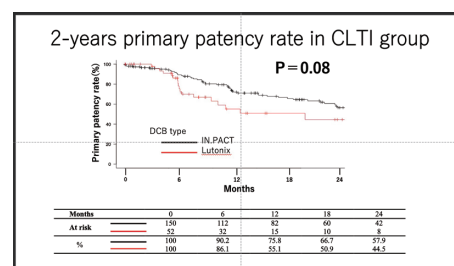
【What's known?】

It remains controversial whether high or low-dose paclitaxel Drug-Coated balloon (DCB) treatment for femoropopliteal (FP) lesions are more useful in patients with intermittent claudication (IC) and chronic limb-threatening ischemia (CLTI).

【What's new?】

The current retrospective multicenter study investigated the impact of different dose DCB devices for FP lesions in IC and CLTI. A total of 473 lesions in 412 patients who had undergone endovascular treatment (EVT) with IN.PACT Admiral DCB (n=372) or Lutonix DCB (n=101) were enrolled from January 2018 to December 2019. They were divided into two groups; IC group (Rutherford 1~3, n=269) and CLTI group (Rutherford 4~6, n=204). The primary endpoint was 2-years patency rate in each DCBs between two groups.

Consequently, Lutonix were used more frequently in CLTI group than IN.PACT ($p=0.04$). The overall 2-years patency rate were 64.3% in IN.PACT group and 47.2% in Lutonix group ($p<0.001$). In IC group, 2-years patency rate were 68.2% versus 49.9% ($P<0.001$) respectively. In CLTI group, there were no significant differences in patency rate between two groups (57.9% versus 44.5%, $P=0.08$). Although high-dose DCB is more useful than low dose DCB for IC patients, low-dose DCB is acceptable in CLTI patients.



MO-3 **A retrospective evaluation of the long-term utility, costs, and trends of using intravascular ultrasound (IVUS) guidance during lower-extremity peripheral vascular interventions (LE-PVI)**

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¹⁾ Kokura Memorial Hospital, Fukuoka, Japan, ²⁾ Boston Scientific APAC HQ, Singapore,

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【What's known?】

Multiple studies have reported lower incidence of vascular complications and major-limb events following IVUS-use. However, there remains a paucity of long-term data following treatment with IVUS-guided LE-PVI among Japanese patients.

【What's new?】

A retrospective, comparative, multi-centre, observational study was designed using claims data from the Medical Data Vision database. All adults undergoing an index LE-PVI between April 2009 to July 2019, with a pre-existing record in the MDV database were included.

Of the total index LE-PVI-population (N=9,845) 3,956 and 5,889 patients underwent LE-PVI with, and without IVUS-guidance, respectively. The mean age of cohort was 72.8 ± 10.3 years. Those who had IVUS-guidance were significantly ($p < 0.001$) more likely to have insulin-treated-diabetes (41% vs. 38%), hypertension (88% vs. 86%), hyperlipidemia (65% vs. 54%); acute coronary syndrome (34% vs. 22%), and a drug-eluting stent deployed (64% vs. 25%).

Compared to angiography-alone, a significant, three-fold lower rate of repeat-LE-PVI events was observed following IVUS-guided index LE-PVI (11% vs. 30%; $p < 0.0001$). Similarly, mean total costs over the overall follow-up period was significantly lower for patients who had LE-PVI with IVUS guidance (-JPY 2,329,819; 95% CI -JPY 3,666,043; -JPY 986,480).

Long-term data from Japan validates that the use of IVUS-guided LE-PVI leads to favourable patient outcomes and lower healthcare expenditure.

MO-4 **Efficacy of drug-coated balloon for chronic total occlusion in femoropopliteal artery**

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¹⁾ Kishiwada Tokushukai Hospital, ²⁾ Kansai Rosai Hospital, ³⁾ Morinomiya Hospital

【What's known?】

The efficacy of the drug coated balloon (DCB) in the femoral popliteal artery lesion has been demonstrated. But there are still few reports of its efficacy in chronic total occlusions (CTO).

【What's new?】

We analyzed clinical result of DCB for CTOs in femoropopliteal artery. This study was multicenter, retrospective analysis. We analyzed consecutive 101 CTO lesions in femoropopliteal artery treated from January 2018 to December 2019 in three Japanese hospitals.

Average age was 74 years. Dialysis patients were 24.8% and 37.6% were chronic limb-threatening ischemia. 83.2% were treated for de-novo lesions and 41.6% lesions included popliteal arteries. Average occlusion length was 83.5mm. Severe calcification of PACSS classification 3 or 4 was 35.6%. The used DCB of 76% were INPACT and 26% were LUTONIX. 1year patency was 76% (95%CI: 66-84%) and freedom from TLR was 88% (95%CI: 79-93%). Univariate analysis of the predictors of restenosis was performed that including popliteal artery was remained as a predictor with a significant difference (35.4% vs 63.6%, p value=0.0268).

In conclusion, clinical data of DCB for CTO lesions was made clear. Including popliteal artery was only predictive factor for restenosis.

MO-5 Comparison of Clinical Outcome of Stent-grafts and Drug-Coated Balloon angioplasty for the Treatment of Superficial Femoral Artery Restenosis Lesion

○Takahide Nakano, Yoshiaki Ito, Masahiro Yamawai, Norihiro Kobayashi, Shinsuke Mori, Masakazu Tsutsumi, Yohsuke Honda, Kenji Makino, Shigemitsu Shirai, Masafumi Mizusawa, Kohei Yamaguchi, Toshiki Chishiki
Saiseikai Yokohama City Eastern Hospital

【What's known?】

Background: In endovascular therapy (EVT) for superficial femoral artery (SFA) restenosis lesion is still challenging. This time we compared clinical outcome of VIABAHN® and DCB angioplasty for SFA restenosis lesion.

Methods: This study was a single center retrospective study. From January 2017 to September 2020, 126 lesions (64 patients) who received EVT for SFA restenosis lesion with VIABAHN® or DCB were included. There were 28 lesions (17 patients) in VIABAHN® group and 98 lesions (47 patients) in DCB group. We assessed clinical outcome at 12 months after EVT. Evaluation items were primary patency.

【What's new?】

Results: There was no significant difference in the rate of in-stent restenosis (ISR) lesion between two groups (VIABAHN® 57% vs. DCB 57%, $p=1.00$) and the rate of chronic limb-threatening ischemia (CLTI) (VIABAHN® 12% vs. DCB 28%, $p=0.32$). The rate of primary patency was 82% in the VIABAHN® group and 64% in the DCB group ($p=0.14$). Conclusion: At 12 months of follow-up, there were no significant difference in primary patency between VIABAHN® and DCB angioplasty for SFA restenosis lesion.

MO-6 Impact of Association between Dissections after Drug-Coated balloon angioplasty and Vessel diameter on the Outcome in the Femoropopliteal Arteries

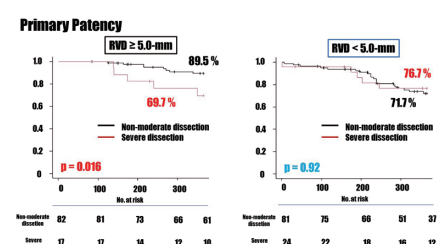
○Masanaga Tsujimoto, Takuya Haraguchi, Tsuyoshi Takeuchi, Tsutomu Fujita
Sapporo Cardio Vascular Clinic

【What's known?】

Serious dissections after uncoated-balloon angioplasty worsen the patency. While, severe dissections posterior to drug-coated balloon (DCB) angioplasty have been associated with acceptable outcomes. However, the impact of the vessel diameter on the outcomes of severe dissections after DCB angioplasty is unknown. This study aimed to investigate that the relationship between dissection severity after DCB angioplasty and vessel diameter affects clinical outcomes.

【What's new?】

The retrospective study enrolled 174 patients (mean age 76.6-years) with 205 lesions treated with DCB at our institution. The main endpoint was one-year primary patency. Patients were divided into two groups, according to distal reference vessel diameter (dRVD) of 5.0-mm, to examine whether dissection severity affected patency. Consequently, the mean lesion diameter was 4.9 ± 1.0 mm. The dRVD ≥ 5.0 -mm group showed significantly higher patency rate compared with dRVD < 5.0 -mm group (86.0% vs. 73.2%, $p=0.04$). Although severe dissections, which are spiral or flow-limiting, was associated with restenosis, in RVD ≥ 5.0 -mm (89.5% vs. 69.7%, $p=0.016$), they did not affect patency in RVD < 5.0 -mm (71.7% vs. 76.7%, $p=0.92$). In conclusion, severe dissections after DCB angioplasty did not worsen patency in small vessels, despite of the adverse outcome in large vessels.



MO-7 Infrapopliteal anatomical predictors of wound recurrence in CLTI patients in the era of the global limb anatomic staging system (GLASS)

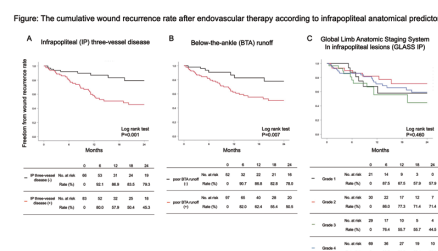
○Takashi Yanagiuchi, Taku Kato, Shunpei Ushimaru, Hirokazu Yokoi
Rakuwakai Otowa Hospital

【What's known?】

Acceptable wound healing rates underlie the widespread use of EVT for patients with CLTI secondary to infrapopliteal lesions; however, post-recovery wound recurrence remains a challenge.

【What's new?】

Objective: Predictors of wound recurrence in patients with CLTI due to infrapopliteal (IP) lesions are explored. **Methods:** We treated 249 de novo CLTI limbs with tissue loss by infrapopliteal EVT from September 2016 to May 2021. Among these, 149 limbs from 133 patients who achieved complete wound healing were enrolled. The wound recurrence rate after complete wound healing was estimated by the Kaplan-Meier method. The association between baseline characteristics and wound recurrence was assessed by the Cox proportional hazard model. **Results:** The wound recurrence rate at 1 year was 30.0%. By multivariate analysis, only infrapopliteal arterial anatomic characteristics remained as risk factors of wound recurrence. Infrapopliteal 3-vessel disease (HR 2.98; 95% CI 1.37-6.47, $p=0.006$) and poor below-the-ankle (BTA) runoff (HR 2.63; 95% CI 1.08-6.44, $p=0.034$) were independently associated with wound recurrence, whereas the GLASS IP grade, IP calcification grade, and isolated below-the-knee lesions were not associated with wound recurrence. **Conclusion:** IP 3-vessel disease and poor BTA runoff were independent predictors of wound recurrence, whereas the GLASS was not predictive.



MO-8 A case of Leriche's syndrome with cerebral infarction during EVT

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【Case overview】

A 61-year-old man was admitted with skin ulceration on the right lateral thigh. The contrast-enhanced CT showed obstruction from the abdominal aorta juxtarenal artery bifurcation to the bilateral external iliac arteries.

【Procedure summary】

The true lumen was successfully passed with 0.014-inch wire, and four covered stents and four bare nitinol stents were implanted. After implantation, a thrombus was observed at the proximal edge of the covered stent, and blood flow was disappeared. We performed thrombus aspiration and balloon dilatation; blood flow was partially resumed. However, thrombus was also observed in the right superficial femoral artery, so we performed thrombus aspiration and balloon dilation again for the superficial femoral artery, balloon dilation for posterior tibial artery, and improved blood flow. The patient became delirious and showed paralysis of the right upper and lower limbs during the procedure. Although head MRI showed cerebral infarction in the left middle cerebral artery region, t-PA was not indicated. Since thrombus retrieval therapy was not available at our institution, conservative treatment was indicated.

【Clinical time course and implication (or perspective)】

Leriche's syndrome is caused by damage to the arterial wall due to atherosclerosis, which leads to endothelial damage and thrombosis. This report describes a case of cerebral infarction during EVT for Leriche syndrome.

MO-9 **A Case of Gap Hemostasis with VIABAHN Stent Grafts**

○Hirokazu Miyashita, Eiji Koyama, Kazuki Tobita, Shigeru Saito
Shonan Kamakura General Hospital

【Case overview】

A case is 50s-year old man complaining of lower limb ulcers. He had past history of insulin depended diabetes mellitus, hypertension, dyslipidemia and chronic renal failure on hemodialysis. Bilateral occlusion of superficial femoral artery (SFA) to below the knee (BK) were pointed out 5 months ago, however, he dropped out. He complained of severe toe pain and pointed out lower limb ulcers, so attending doctor referred to us.

【Procedure summary】

We performed endovascular therapy (EVT) for left SFA with contralateral approach. Intravascular ultrasound revealed concentric severe calcification in SFA and eccentric calcification in common femoral artery (CFA). We decided combination therapy with interwoven nitinol stent and stent graft and performed pre-dilatation with 7mm non-compliant balloon. After balloon dilatation, vessel rupture was confirmed in distal CFA. We implanted stent grafts according to the lesser curvature side in CFA to SFA and preserved the deep femoral artery (DFA) flow on the greater curvature side. When we performed BK intervention 2 week later, pseudoaneurysm in stent gap was confirmed. The aneurysm was treated combination therapy with balloon tamponade with thrombin injection.

【Clinical time course and implication (or perspective)】

Stent graft implantation is secure for vessel rupture, however, the technique sacrifices side branch flow. We reveal detail of the technique in this report.

MO-10 **The Usefulness of Long BNS for Very Elderly Patients with Femoropopliteal Artery Thrombotic Occlusion**

○Hiroshi Araki, Shigeru Kuroki
Yokosuka General Hospital Uwamachi

【Case overview】

90s females with thrombotic occlusion of the femoropopliteal artery with acute ischemia.

【Procedure summary】

Case 1: 0.035 knuckle wire advanced to the popliteal artery supported with 4F TEMPO catheter and replaced with 0.014 wire. Retrograde angiography through T-VAC showed much thrombus in the lesion. Dilated with 4.0mm balloon but no BK blood flow obtained. 0.014 wire advanced to distal ATA under Corsair PV support, and followed dilatation with 2.5mm balloon. Patient became restless, so two BNS 200mm and a DES 40mm were placed immediately. Those long BNS made procedure time shorten with quite acute gain. Finally a better flow was obtained. Case2: Angiography showed thrombus occlusion from the distal SFA in right side. As mentioned, 0.035 knuckle was used to reach the popliteal artery and 0.014 wire reached the distal ATA. 2.0 mm balloon was dilated in the ATA and 4.0 mm balloon in the femoropopliteal lesion. 200 mm BNS was placed in whole lesion and good blood flow was achieved.

【Clinical time course and implication (or perspective)】

Longer BNS may be useful in elderly patients with thrombotic arterial occlusive lesions to shorten and simplify the procedure, and to avoid long term postoperative DAPT.

A case of VIABAHN implantation for arteriovenous fistula and pseudoaneurysm

○Daisuke Yamazaki, Takahide Fuzihasi, Hirokazu Amamizu, Toru Takahashi,
Satoru Horiguti

Akita Cerebrospinal and Cardiovascular Center

【Case overview】

A 60s female with paroxysmal atrial fibrillation underwent pulmonary vein isolation. The next day, a pseudosneurysm at the right DFA was detected.

【Procedure summary】

Percutaneous thrombin injection was performed. While 6.0mm balloon dilatation at DFA, thrombin 1,000 units was injected in the pseudosneurysm. However, three days after the procedure, recanalization of pseudoaneurysm and arteriovenous fistula were detected . Angioplasty was demonstrated, 6.0×50mm VIABAHN was deployed at the DFA. Final angiogram showed no pseudoaneurysm and arteriovenous fistula.

【Clinical time course and implication (or perspective)】

After the procedure, the patient discharged with neither any symptoms nor complications. This procedure is less invasive than conventional surgical procedure.

Rupture of peroneal artery aneurysm as a late complication related to angioplasty

○Kazuhiro Asano

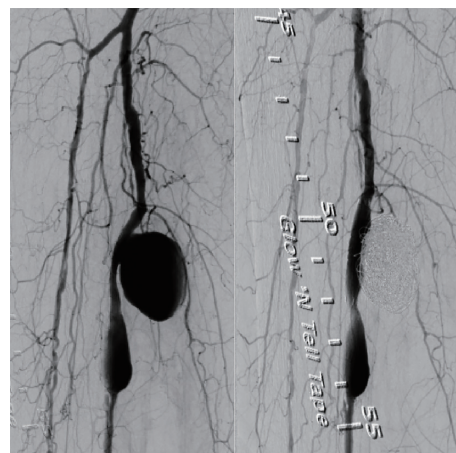
Tokyobay Urayasu Ichikawa Medical Center

【Case overview】

Rupture of below-the-knee aneurysm (rBKA) following angioplasty is rare. Here, we report a case of successful treatment with stentgraft implantation and coil embolization for rBKA. An 86-year-old man with history of stroke presented with a painful ulcer in his right 5th toe for two months (Rutherford5). A computed tomographic angiography (CTA) revealed total occlusion of peroneal artery (PA) and an endovascular treatment (EVT) was performed.

【Procedure summary】

A guidewire was advanced through the lesion successfully by antegrade approach and balloon angioplasty was performed. Although the intravascular ultrasound revealed that the guidewire passed through intra-media route, a final angiogram showed excellent blood flow. Ten days later, however, he experienced gradual onset of severe pain and swelling in his right leg and CTA showed rBKA. An emergent fasciotomy was performed for clinical suspicion of acute compartment syndrome. An urgent angiogram showed saccular aneurysm of PA. Before the stentgraft implantation, five coils were subsequently deployed inside the aneurysm to prevent it from further expansion due to end-leak. Then a 5.0×50mm stentgraft was placed to exclude the aneurysm. A final angiogram showed no residual flow into the aneurysm and excellent blood flow.



【Clinical time course and implication (or perspective)】

The patient had an uneventful postoperative course and discharge to home.

MO-13 My most tough CLTI case in these days

○Takuma Tsuda

Ekisaikai Hospital

【Case overview】

60's male with ERSD had small ulcer in his right 2/3 toe. (W1, I3, FI1)

ABI was NA/0.66

AoG showed long CTO with severe calcification from proximal-SFA to distal BTK.

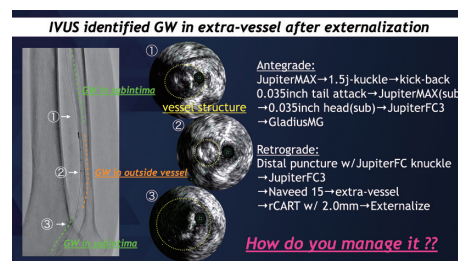
【Procedure summary】

1st EVT: antegrade wiring was navigated into POP true lumen. 6.0mm HP and 2DESs was deployed from SFAmid and SFAdis. 2nd EVT: Distal DES was occluded in 1week, however, dorsal artery was visualized from collateral clearly. Retrograde system was navigated by DP, after antegrade wiring with IVUS guidance was initiated. However any super hard CTO wire never passed POP lesion. Retrograde knuckle wire technique and drilling technique was failed to wire perforation. Antegrade wire was intentionally navigated into subintima, however, any wire couldn't pass ATAos lesion. Radifocus tip was navigated ATAos, and CTO wire was navigated into the same subintima. Retrograde wire was navigated to close to antegrade wire, and rCART with 2.0mm balloon was performed for externalization. IVUS showed that GW existed outside vessel from ATAos to ATAmid. How do you manage this perforation? I will show the way of my strategy.

【Clinical time course and implication (or perspective)】

Clinical time course: ABI improved into 0.70 and ulcer healed after 1month.

Implication: 1. The management of perforation



MO-14 Two cases of stent thrombosis in Eluvia

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¹⁾Tokyo-Kamata Hospital, ²⁾TOWN Visiting Clinic Johnan

【Case overview】

Case 1 and case 2 were 70s man with intermittent claudication.

【Procedure summary】

In case 1, angiography revealed a stenotic lesion in the proximal part of the left SFA, so Eluvia 7 /120 mm was placed. Two years later, resting leg pain appeared and angiography revealed an obstructive lesion from the proximal part of the stent to the distal SFA. Angiography after balloon dilatation showed a large amount of thrombus in the stent. Thrombus aspiration was performed and Viabahn 6.0 / 250 mm was placed.

In case 2, angiography showed a long CTO lesion of the right SFA. Two DCBs were dilated in SFA distal site, and Eluvia 7 /120 mm was placed in the proximal part where dissociation occurred. Seven months later, leg pain appeared, and angiography revealed that the SFA was obstructed. Since a large amount of thrombus was found in the stent, DOAC was added after the balloon was dilated and re-study was scheduled. Angiography after 1 month showed no significant change, and viabahn 6.0 / 250 mm was placed at the same site.

【Clinical time course and implication (or perspective)】

Through two cases, we will consider the cause of stent thrombosis caused by Eluvia and the subsequent treatment strategy.

MO-15 The no-flow phenomenon following drug-coated balloon angioplasty in a patient with chronic limb-threatening ischemia and history of below-knee amputation

○Mitsuo Sobajima, Teruhiko Imamura, Atsuko Fukuo, Yohei Ueno, Hiroshi Onoda, Hiroshi Ueno, Koichiro Kinugawa

Second Department of Internal Medicine, Toyama University

【Case overview】

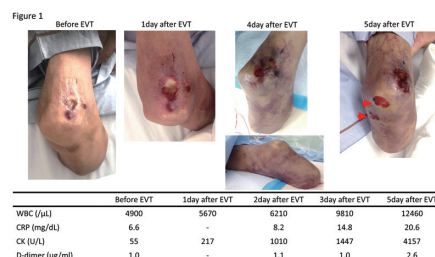
69s male who was dependent on hemodialysis for 7 years was diagnosed with left-limb CLTI and received BK amputation 6 years ago. He began to complain of pain due to worsening CLTI at his left knee and was admitted to our institute to do EVT.

【Procedure summary】

The angiography showed diffuse long severe calcified stenosis with a calcified nodule. The high-pressure dilatation using a 4.0-mm balloon improved SFA to popliteal artery flow. Following the DCB dilatations using Lutonix® 4.0 × 150 mm and Lutonix® 4.0 × 100 mm, peripheral flow vanished. An IVUS confirmed no flow limiting dissection or thrombus obstruction. Therefor we suspected no-flow phenomenon due to DCB-related peripheral embolization.

【Clinical time course and implication (or perspective)】

After EVT, he complained of pain and cyanosis inside of his left thigh. At post-EVT day 2, serum creatinine kinase began to increase. New ulcers developed at post-EVT day 5 (Figure). He received AK amputation at post-EVT day 6. Pathological analysis showed fibrinoid necrosis and infiltration of inflammatory cells around peripheral artery obtained from vastus medialis. Patients with post-BK amputation often have extremely long lesions without any runoff. Given the estimated high risk of severe downstream effects, DCB might be harmful to those with post-BK amputation.



MO-16 A novel technique of percutaneous intraluminal cracking using a guidewire introducer for severe calcified peripheral artery disease

○Chai Hock Chua

Shin Kong Wu Ho-Su Memorial Hospital

【What's known?】

Heavy calcified arterial lesions are challenging to endovascular treatment. Even if a guide wire passes the lesion, calcified plaque can inhibit passage or dilation of the balloon catheter. We developed a novel technique of percutaneous direct needle puncture of calcified plaque (PIERCE) to allow subsequent passage and dilation of the balloon. PIERCE was performed in one patients with common femoral artery (SFA) lesions and one patient with a distal anterior tibial artery lesion. In these two cases, balloon passage and lesion dilatation were achieved after using this technique. We will demonstrate a different way of PIERCE technique by using a guidewire introducer, instead of puncture needle, to puncture the calcified plaque and explained the benefit of using this guidewire introducer.

【What's new?】

This report demonstrates the benefit of using a guidewire introducer, instead of puncture needle, to puncture through the calcified plaque and created a space for further device passage.

MO-17 **Animated Volume Rendering versus Computed Tomography for Comprehension of Vascular Anatomy by Junior Doctors**

○Mei Ping Melody Koo, Hansraj Riteesh Bookun
St Vincent's Hospital Melbourne

【What's known?】

Three-dimensional volume rendering (VR) has been shown to improve anatomical visualisation. CT-angiography is a key imaging modality for assessing vascular pathology. This study aims to determine the value of integrating VR animations into daily practice for junior doctors, as compared to using CT images.

【What's new?】

METHODS:Two cases (brachial artery pseudoaneurysm, carotid body tumour) were evaluated by 22 junior doctors. Participants were surveyed via an online questionnaire and were asked to provide diagnoses based on axial CT and VR animations. Diagnostic accuracy was compared between the two modalities. These were followed by four self-evaluation questions assessing anatomical comprehension and diagnostic confidence.

RESULTS:3D VR visualisation improved diagnostic accuracy by 59% on average. Brachial artery pseudoaneurysm was correctly diagnosed by 86% and 14% of participants based on VR and CT images, respectively; carotid body tumour was correctly diagnosed by 59% and 14% of participants based on VR and CT. 43% of participants became more diagnostically confident following animated visualisation. All agreed that it would improve spatial awareness and education.

CONCLUSION:VR visualisation increases diagnostic accuracy and confidence in vascular pathologies amongst junior doctors. Integrating rendered animations into clinical practice could assist in clinical management.

MO-18 **Effective endovascular treatment for common femoral artery with calcified plaques using direct bare metal needle puncture**

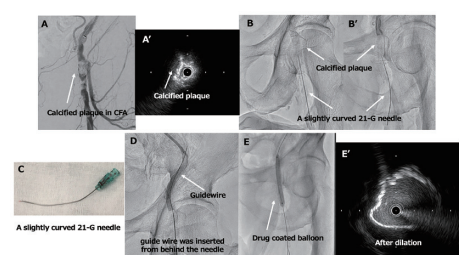
○Teruaki Kanagami, Naoki Hayakawa, Jyunji Kanda
Asahi General Hospital

【What's known?】

Surgical endarterectomy for common femoral artery (CFA) disease is considered the gold standard for treatment. Furthermore, there are often calcified plaques in CFA lesions and calcified plaques make it difficult to treat by endovascular therapy (EVT). However, there are some clinical reports in order to overcome calcified lesion in CFA.

【What's new?】

Recently, we developed a useful technique for passing a lesion by directly penetrating the calcified plaque of the CFA using a bare metal needle and then passing through a balloon or dilating it. We named this technique "BAMBOO SPEAR". In 5 cases, we use this technique for CFA lesion with calcified plaques. Median procedure time of this technique was 14(3-19) minutes. Except one case, we didn't use a stent in CFA. After the procedure, ankle brachial index values increase from 0.47 ± 0.25 to 1.12 ± 0.07 . During a mean follow-up period of 12.2(4-20) months, all the CFA lesions were kept patent. Procedural-related complication occurred in one case. However, it was arteriovenous fistula and did not need additional treatment. Therefore, I think BAMBOO SPEAR technique is a relatively safe and effective method for CFA lesion with calcified plaque.



MO-19 Initial experience of a new CTO closing catheter as a lesion modification device

○Takaaki Ozawa, Masayoshi Kimura, Yusuke Kakei, Eisuke Kataoka, Daisuke Ito, Akiteru Kojima, Eigo Kishita, Yusuke Nakagawa, Jun Shiraishi, Masayuki Hyogo, Takahisa Sawada

Japanese Red Cross Kyoto Daiichi Hospital

【What's known?】

BACKGROUND: One of the most challenging situations of below the knee intervention is the failure of delivery balloon catheter after successful guidewire crossing due to severe calcification. We had used CROSSER as a lesion modification device, and we attempted to use Wingman instead of CROSSER from this half year ago. This study aimed to evaluate the efficacy and safety of Wingman compared with CROSSER.

【What's new?】

METHOD: Wingman group (n=14) from August 2021 to March 2022 and CROSSER group (n=23) from April 2014 to March 2015 were evaluated for the successful balloon catheter crossing and any complication, respectively. RESULT: The patient characteristics were 76.3% on hemodialysis, 81.6% of diabetes mellitus, 60% of smokers. The distribution of the target lesions was not different between the two groups. The successful balloon crossing rate as an efficacy endpoint was no difference between the two groups (CROSSER 63.9% VS Wingman 79.2%, $p=0.449$). The rate of any complication as a safety endpoint was higher in the CROSSER group (CROSSER 35% VS Wingman 0%, $p=0.014$)

CONCLUSION: The Wingman catheter is an effective lesion modification device in below the knee intervention and more safety tool compared with CROSSER.

MO-20 Complications and reflections on using Proglide

○Shohei Morita, Arudo Hiraoka, Hidenori Yoshitaka

The Sakakibara Heart Institute of Okayama

【What's known?】

In recent years, due to the minimal invasiveness of treatment, endovascular aortic repair (EVAR), thoracic endovascular aortic repair (TEVAR), and transcatheter aortic valve implantation (TAVI) have become popular. The low profile of the delivery system has advanced, and it has become possible to treat cases with thin access blood vessels, and it has become possible to treat with puncture without exposing the blood vessels. By using two system of the proglide, hemostasis at the arterial puncture site of the sheath of up to 21 Fr is possible. The spread of this proglide has greatly contributes to the expansion of endovascular treatment by puncture.

【What's new?】

At our hospital, we have done a lot of hemostasis by the proglide and we have experience of complications. The iliac artery injury caused by proglide was bailed out by hemostasis using Viabahn. Angioplasty was performed for vascular occlusion caused by proglide. We would like to discuss complications and help with safe endovascular treatment in the future.

MO-21 Two year outcomes of endovascular therapy for femoropopliteal arterial lesions for patients with high bleeding risk

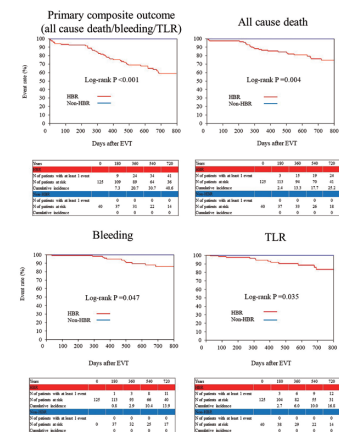
○Yuki Shima, Akihiro Ikuta, Hiroyuki Tanaka, Kazushige Kadota
Kurashiki Central Hospital

【What's known?】

The Academic Research Consortium (ARC) recently published a definition of patients at high bleeding risk (HBR) undergoing percutaneous coronary intervention. However, the prevalence of the ARC-HBR criteria in patients undergoing endovascular therapy (EVT) for femoropopliteal arterial lesions has not been thoroughly investigated. We aimed to evaluate two year bleeding event, mortality and the patency for patients with HBR after EVT.

【What's new?】

The study population comprised 165 patients who underwent their first EVT for femoropopliteal lesions between 2018 and 2019, were divided into two groups according to ARC-HBR criteria. The primary end point was a composite outcome of all-cause death, Bleeding Academic Research Consortium 3 or 5 bleeding, and target lesion revascularization (TLR) within two years of EVT. Of the 165 patients, 125 (75.8%) patients had HBR and 40 (24.2%) patients had no HBR. The figure of Kaplan-Meier showed the outcome of primary endpoint for two years. HBR patients had higher risk for all cause death, bleeding, and TLR. Most patients with PAD were classified as having HBR, and HBR patients were at a higher risk of mortality, bleeding events, and TLR compared to those without HBR.



MO-22 Objective estimation of calcified nodule predicts successful wire crossing in peripheral artery disease

○Dai Ozaki, Ken Yokoyama, Syohei Ouchi, Kazuhisa Takamura, Kenji Yaginuma, Tetsuro Miyazaki, Takashi Tokano, Takashi Iwasaki, Satoru Kawai, Toru Minamino
Juntendo Urayasu Hospital

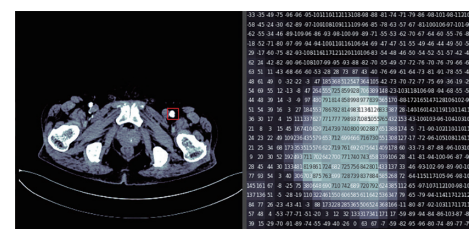
【What's known?】

The presence of calcified nodules in peripheral artery is a clinical problem in vascular intervention. To penetrate center of nodules with the wire and expand them from inside is often performed but is sometimes difficult to achieve. The aim of this study is to clarify whether objective evaluation of the hardness of calcified nodule using computed tomography (CT) are related to the wire passability.

【What's new?】

We enrolled 29 lesions of 15 patients who received a strategy to penetrate the nodule with wire in the CFA-Pop lesion from October 2020 to December 2021. The Hounsfield Unit (HU) values of nodules were calculated as mean value of HU in three consecutive cross-sectional slices of target nodule using non-contrast CT. As a result, wire penetrated the nodule at 22 lesions, which cases showed significant lower CT values compared to the non-penetrating cases (423 ± 16 vs. 574 ± 29 HU, $P < 0.01$). Receiver operating characteristic curve showed about 530 HU as an optimal cut-off value for successful wire penetration.

In conclusion, objective evaluation of hardness of calcified nodules using HU value before procedure could predict successful wire crossing in the nodules for peripheral artery disease.



MO-23 Successful endovascular treatment of SFA CTO using trans ankle intervention

○Shoichiro Furukawa, Shoji Kawakami, Keita Inanaga, Shujiro Inoue
Aso Iizuka Hospital

【Case overview】

The case was a 76-year-old male with Rutherford 4. The target lesion was the right SFA with chronic total occlusion. Seven years ago, EVT with an antegrade approach was unsuccessful.

【Procedure summary】

We firstly punctured the right CFA and inserted 6Fr sheath. We used guide 5.5Fr catheter and a 0.014 inch-hard guidewire, but couldn't get it through. Secondary, we punctured PTA as a retrograde approach, with 5Fr guiding sheath (Parent® Select 5082) . The retro sheath back up was strong and stable, so IVUS guide wiring and loop wire technique from retrograde allowed to pass the CTO lesion through. After POBA, we deployed stent graft (VIABAHN). Since the proximal stent graft became shorter and SFA ostium lesion remained, we additionally deployed drug-eluting stent (ELUVIA). The puncture site stopped bleeding with balloon occlusion and external compression.

【Clinical time course and implication (or perspective)】

Stent graft and DES patency was confirmed 1, 3 and 6 months. In tough SFA lesions, trans -ankle intervention which is highly backup and sheath stability can also be used with IVUS, can be used safely and effectively by paying attention to bleeding complications.

MO-24 Initial experiences of Removing Calcified Plaque by Intentional Crosser Bias Control with Angled Support Catheter (REIWA) technique in calcified lesion

○Yuichiro Hosoi¹⁾, Yutaro Kasai¹⁾, Kouhei Isikawa²⁾, Ken Kuroda¹⁾, Hiroki Bouta¹⁾,
Yuki Katagiri¹⁾, Yasunobu Gohira¹⁾, Go Takenouti²⁾, Kazumasa Yamasaki¹⁾,
Tomoyuki Tani¹⁾, Seizi Yamazaki¹⁾

¹⁾Sapporo Higashi Tokushukai Hospital, ²⁾Sapporo Tokushukai Hospital

【What's known?】

No atherectomy device is available in Japan for calcified lesions in peripheral artery disease. The Crosser catheter is a unique device that facilitates crossing chronic total occlusion by means of mechanical vibration. Its efficacy in a calcified stenotic lesion is also reported. However, in a large vessel, it is not operational as the tip of the Crosser loses contact with the vessel wall.

【What's new?】

To overcome such limitation, we used an angled support catheter to control the bias of the Crosser® tip, resulting in good contact with the calcified plaque. From May 2019 to February 2021, we treated 9 lesions in 7 patients with this technique. A summary of initial experiences and clinical results (one-year primary patency) will be presented.

MO-25 Erroneous incomplete stent apposition observed using optical frequency domain imaging following implantation of peripheral self-expanding nitinol stents

○Takashi Miwa, Michinao Tan, Shohei Hieda, Yusuke Sato, Taichi Hayashi,
Kazushi Urasawa
Tokeidai Memorial Hospital

【Case overview】

The patient was a 70-year-old woman with peripheral artery disease. Her right superficial femoral artery was occluded and recanalized with DCB. However the SFA lesion got restenosis four month after EVT and 2nd EVT was performed.

【Procedure summary】

Following initial angiography and an OFDI examination, which demonstrated a reference diameter of 5mm, balloon angioplasty was performed using 5mm balloon catheter followed by implantation of 6 x 120mm Eluvia stents. Subsequent to post dilatation using a 5 mm balloon catheter at the rated burst pressure (5.26 mm as stated on the balloon compliance chart), OFDI revealed a maximum and minimum lumen diameter of 5.16 mm and 4.54mm, respectively, and indicated that the stent struts seemed to be uniformly malapposed

【Clinical time course and implication (or perspective)】

We performed ex vivo experimental test using four different self-expanding stents, Eluvia stent, Misago stent, SMART stent, and Zilver PTX stent. Each 6 mm stent was implanted in a plastic tube with a 6 mm inner diameter and post dilatation with 7-mm-diameter balloon was performed. Follow up OFDI examination demonstrated similar images to the aforementioned case with the distance between the strut and the inside of the tube measured at 0.18 to 0.24mm

MO-26 Transient portal hypertension might happen after drug-eluting stent implantation in superior mesenteric artery

○Yuya Asano, Masayoshi Kimura, Takaaki Ozawa, Yusuke Kakei, Eisuke Kataoka,
Akiteru Kojima, Daisuke Ito, Eigo Kishita, Yusuke Nakagawa, Jyun Shiraishi,
Masayuki Hyogo, Takatomo Shima, Takahisa Sawada
Japanese Red Cross Kyoto Daiichi Hospital

【Case overview】

We firstly report endovascular treatment using a drug-eluting stent and an interesting clinical course after revascularization.

A 74-year-old woman with a history of refractory ischemic colitis and gastric perforation complained of postprandial abdominal pain. Contrast-enhanced computed tomography showed the occlusion of celiac and infra mesenteric artery and severe stenosis of SMA. We planned endovascular treatment for SMA.

【Procedure summary】

A 6Fr sheath was inserted abdominal aorta via her right brachial artery. IVUS revealed the vessel diameter and lumen diameter at the target lesion was 4mm and 2mm, respectively. A drug-eluting self-expanding stent (ELUVIA, Boston, USA) which was expected gradual vessel expansion and inhibit intimal hyperplasia, was implanted in the proximal SMA with IVUS guidance.

【Clinical time course and implication (or perspective)】

After EVT, she complained of abdominal pain and watery diarrhea. Furthermore, the number of platelets decreased 170000 to 57000 at the same time. CT revealed edematous colon and increasing ascites, but colon fiberoscope showed no sign of ischemic colitis. The ascites and thrombocytopenia improved without any treatment. There is a report that the possibility of transient portal hypertension after surgical bypassing for chronic mesenteric ischemia. We herein firstly report ascites and thrombocytopenia after endovascular treatment, which could be caused by transient portal hypertension.

MO-27 **A case of fenestration of superficial femoral artery**

○Maki Ohira, Kenji Suzuki, Naoki Fujimura
Tokyo Saiseikai Central Hospital

【Case overview】

70-year-old male with chronic limb threatening ischemia was referred to our hospital. SPP showed 27mmHg, revascularization was scheduled.

【Procedure summary】

We inserted 5F sheath via common femoral artery antegradely. Angiography revealed double lumen sign of the superficial femoral artery. Computed tomography indicated the two arteries were located in the same vascular sheath.

【Clinical time course and implication (or perspective)】

Peripheral arterial anomaly is relatively common, especially in the below knee artery. But fenestration of superficial femoral artery are considered to be rare abnormality in angiographic studies. We report a rare fenestration case with literature review.



MO-28 **Successful endovascular therapy with “Direct tip Injection in Occlusive Lesions” technique for persistent sciatic artery occlusion**

○Masanaga Tsujimoto, Takuya Haraguchi, Tsuyoshi Takeuchi, Tsutomu Fujita
Sapporo Cardio Vascular Clinic

【Case overview】

An 80-year-old woman was admitted to our hospital due to left severe intermittent claudication, Rutherford classification 3. Her left ankle-brachial index was 0.74. Computed tomography angiogram (CTA) revealed the left persistent sciatic artery (PSA) occlusion with an aneurysmal formation. Considering surgical complexity and her frailty, we decided to perform endovascular treatment (EVT).

【Procedure summary】

Angiography demonstrated the left PSA occlusion from her internal iliac artery, reconstitution of the left popliteal artery (PopA) supplied from deep femoral artery and hypoplastic SFA. After antegrade wiring failure by contra lateral approach, retrograde system with 0.035-in. guidewire via posterior tibial artery was advanced into the occlusion using knuckle wire technique, and direct tip injection in occlusive lesions (DIOL) technique from both of catheters to visualize the vessel road and modify the plaque bidirectionally. Then, we performed the reverse controlled antegrade and retrograde tracking (reverse CART) with a 4.0-mm balloon dilation, and the retrograde guidewire successfully crossed the occlusion. After the guidewire crossing, stent-grafts and self-expanding stent were deployed and a sufficient flow was obtained without complications.

【Clinical time course and implication (or perspective)】

Her symptom improved and ABI normalized after procedure. CTA after 15 months confirmed no restenosis. EVT, including DIOL technique, is a safe and effective treatment for PSA aneurysmal occlusion.

MO-29 Efficiency of a steerable sheath for cannulation of visceral arteries during fenestrated and branched endovascular aortic repair for thoracoabdominal aneurysms

○Takeshi Baba, Kota Shukuzawa, Hiromasa Tachihara, Masayuki Hara, Hirotsugu Ozawa, Makiko Omori, Yoshihiko Chono, Ryosuke Nishie, Hiroyuki Suzuki, Takao Ohki

The Jikei University School of Medicine, department of Surgery, division of Vascular Surgery

Cannulation and stenting for visceral arteries is a critical step in fenestrated and branched endovascular aortic repair (FB-EVAR) procedures. Using a steerable sheath can help to facilitate challenging target vessel. In this case report, we report three cases of visceral vessel cannulation and intubation using the Agilis steerable introducer (St. Jude Medical) in FB-EVAR. Two cases were FB-EVAR and one was a physician modified F-EVAR. The mean age was 78.3 years and the mean aneurysm diameter was 60 mm. Agilis was used in the following cases: a case with difficulty in cannulation from common femoral artery (CFA) to the fenestration site of right renal artery in the physician modified F-EVAR case, a case with difficulty in cannulation from brachial artery to the sleeve branch of celiac artery, a case with difficulty in cannulation from CFA to the sleeve branch of superior mesenteric artery. In all cases, the use of Agilis enabled rapid cannulation, which contributed to safe visceral revascularization and reduction of operative time and fluoroscopic time. The initial experience of Agilis in patients with difficult cannulation for visceral arteries showed its potential as a safe alternative.

MO-30 Hybrid repair of deep femoral artery aneurysm in a patient with frailty

○Kaichiro Manabe, Hidetake Kawajiri

Kyoto Prefectural University of Medicine

【Case overview】

We present the case of an 89-year-old man with a deep femoral artery aneurysm (DFAA), which was successfully treated with hybrid repair.

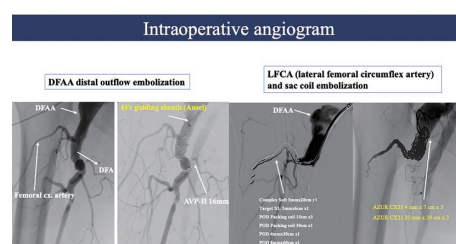
【Procedure summary】

As the DFAA (maximum diameter: 36 mm) was extending distally with a short proximal neck, hybrid repair was considered to be the best option. A 6-Fr sheath was inserted toward the deep femoral artery through a small (30 mm in length) groin incision. First, the outflow of the DFAA was occluded with a 16-mm Amplatzer vascular plug (AVP-II). Then, selective external circumflex artery coil embolization and DFAA sac embolization were performed to minimize type II endoleak. After removing the 6-Fr sheath, the DFAA was separated from the circulation by proximal neck ligation.

Postoperative computed tomography showed no endoleak with preserved distal limb perfusion.

【Clinical time course and implication (or perspective)】

The patient was discharged from the hospital on postoperative day 4 without any complications.



MO-31 1-year patency of DCB, DES, stent graft and combination of these devices in EVT for FP lesion

○Shun Kudo, Yoshito Yamamoto, Naoki Chiba, Satoshi Tsuchiya, Masamichi Nogi,
Masato Segawa, Kenichiro Hanawa, Fumio Yamashita, Masafumi Sugi
Iwaki City Medical Center

【What's known?】

In endovascular treatment (EVT) for femoro-popliteal artery lesion (FP), various options of devices are continuously introduced and the patency of this lesion is also improved. Now, our main device for FP is drug-coated balloon (DCB), however, some lesions require drug eluting stent (DES) or stent graft (SG), such as major dissection after balloon angioplasty. With very long FP lesion, we often use combination of DES and SG to achieve lesion full-coverage, avoid edge restenosis, and preserve collateral flow.

【What's new?】

We investigated the difference of 1-year follow up results between these procedures. Data of EVT for FP from 2018 to 2020 were analyzed retrospectively. 231 FP lesions were treated in this period and 125 lesions were followed at 1-year. Among them, 81 lesions were treated by DCB, 26 by DES and 10 by SG, respectively. 8 lesions were treated by combination of DES and SG. TLR rate in 1 year was 34.6% in DCB, 15.4% in DES, 20% in SG, and 12.5% in DES and SG group, respectively. We will report the detail of 1-year follow up results of these devices for FP in our institute, and discuss about the optimal strategy for this kind of lesion.

MO-32 Patency of Deep Femoral Artery Associated with Treatment of Complex Proximal Superficial Femoral Artery Lesions

○Yuki Kozai, Yoshiaki Ito, Masahiro Yamawaki, Norihiro Kobayashi, Shinsuke Mori,
Masakazu Tsutsumi, Yosuke Honda, Kenji Makino, Masafumi Mizusawa,
Shigemitsu Shirai, Kohei Yamaguchi, Tahahide Nakano
Saiseikai Yokohama-City Eastern Hospital

【What's known?】

This study investigated the impact of angioplasty by drug-coated balloon (DCB) and self-expandable stent during endovascular treatment of proximal superficial femoral artery (SFA) lesions on the patency of deep femoral artery (DFA).

【What's new?】

We retrospectively enrolled 193 patients (DCB; n=42, STENT; n=151) with de-novo lesions for proximal SFA lesions between April 2007 and March 2020. The proximal SFA lesions were defined as the regions, 10 mm proximal to the SFA ostium and 10 mm distal to the carina. In STENT group, when stent proximal edge was at or over the shoulder of bifurcation covering the DFA ostium, it was classified as jailed DFA (jailed DFA; n=89, non-jailed DFA; n=62).

There were no significant differences for the SFA patency rates between DCB and STENT groups (87.3% vs. 76.0%; $P=0.24$). However, the DFA patency rate was higher in DCB group than STENT group (96.6% vs. 82.7%; $P=0.048$). In addition, the DFA patency rate was lower in jailed DFA stenting than non-jailed DFA stenting (87.6% vs. 97.3%; $P<0.01$).

In treatment for proximal SFA lesions, DCB angioplasty and non-jailed DFA stenting may contribute to the DFA patency.

MO-33 Comparison of the impact of short versus prolonged dual antiplatelet therapy on major adverse limb events and major bleeding after endovascular therapy in patients with high bleeding risk

○Shutaro Goda, Yoshiaki Ito, Shinsuke Mori

Saiseikai Yokohama City Eastern Hospital

【What's known?】

Background: Until now, there have been few reports of appropriate dual antiplatelet therapy (DAPT) duration after endovascular therapy (EVT) for Japanese patients who are high bleeding risk (HBR) in clinical practice.

【What's new?】

Method: In this study, we collected 245 HBR patients who underwent EVT for superficial femoral artery (SFA) from 2015 to 2019 in our hospital retrospectively and classified them into two groups: short-DAPT group (within 90 days DAPT after EVT, n=98) and prolonged-DAPT group (over 90 days DAPT after EVT, n=148). All patients satisfied the Academic Research Consortium HBR criteria. DAPT was defined as aspirin and thienopyridine, not including cilostazol. The primary and co-primary outcomes of interest were bleeding and major adverse limb events (MALE) within 2 years.

Result: There is tendency of less Bleeding Academic Research Consortium (BARC) 3 and 5 bleeding in short-DAPT group than prolonged-DAPT group (2.0 vs 6.1%; p=0.13). MALE and TLR were not significantly different between 2 groups, respectively (35.3% vs 38.6; p=0.63, 29% vs 32.4%; p=0.68).

Conclusion: Short-DAPT might reduce BARC 3 and 5 bleeding events in HBR patients without increasing MALE and TLR after EVT for SFA. Short-DAPT should be considered for HBR patient, however further study will be required.

MO-34 The short-term clinical outcomes after drug-coated balloon angioplasty for femoropopliteal in-stent occlusion

○Kohei Yamaguchi, Shinsuke Mori, Takahide Nakano, Masafumi Mizusawa,
Shigemitsu Shirai, Toshiki Chishiki, Kenji Makino, Yohsuke Honda,
Masakazu Tsutsumi, Norihiro Kobayashi, Masahiro Yamawaki, Yoshiaki Ito

Saiseikai Yokohama-city Eastern Hospital

【What's known?】

The patency rate after standard balloon angioplasty for femoropopliteal (FP) in-stent occlusion (ISO) lesions has been reported to be much lower than that for non-occlusive in-stent restenosis (ISR) lesions. Although drug-coated balloon (DCB) angioplasty seems to be effective in patients with FP ISR lesions, the clinical outcomes of DCB angioplasty for FP ISO lesions is still unclear.

【What's new?】

This single center, retrospective and observational study evaluated consecutive 37 limbs which underwent DCB angioplasty for FP ISR lesions between October 2018 and February 2021. The limbs were classified into 2 groups: 15 limbs with ISO lesions (ISO group) and 22 limbs with non-occlusive ISR lesions (ISR group). Clinical outcomes between those two groups were compared. Baseline patient characteristics were almost similar. The mean lesion length for ISO and ISR groups was 256 ± 72 mm and 168 ± 116 mm (p=0.03), respectively. The mean reference vessel diameter for ISO and ISR groups was 4.7 ± 1.3 mm and 5.1 ± 0.7 mm (p=0.23), respectively. Kaplan-Meier estimates of primary patency were 86.2% and 73.0% for ISO and ISR groups at 1-year (log-rank p=0.45).

The 1-year clinical outcomes after DCB angioplasty for FP ISR lesions were similar between ISO and ISR groups. DCB angioplasty might be effective even for FP ISO lesions.

MO-35 The predictors of early occlusion after DCB treatment in femoropopliteal lesion

○Haruya Yamane, Tatsuhisa Ozaki, Shumpei Kosugi, Tsuyoshi Mishima, Kuniyasu Ikeoka, Haruhiko Abe, Kichi Inoue, Yasunori Ueda, Yasushi Matsumura, Yukihiro Koretsune

National Hospital Organization, Osaka National Hospital

【What's known?】

Drug-coated balloon (DCB) has been a well-established strategy of endovascular treatment (EVT) in femoropopliteal (FP) lesion. DCB is recommended for the lesions without more than 50% stenosis or severe dissection after balloon dilatation. However, it is often effective for the lesions beyond the criteria.

【What's new?】

We occasionally experienced the early occlusion after DCB treatment. However, its predictors are poorly understood.

(Method) A total of 47 patients (age 74 ± 8 years, male 63% and diabetes 66%) with peripheral artery disease who underwent EVT with DCB were retrospectively analyzed. We defined early occlusion as the occlusion of treated lesion within 1 day after EVT. The grade of vessel dissection was assessed by angiogram and minimum lumen area (MLA) was measured by intravascular ultrasound.

(Result) The early occlusion occurred in 7 (15%) patients. The patients with early occlusion had significantly higher incidence of chronic total occlusion (CTO) (100% vs. 35%, $p=0.001$), in-stent lesion (42.9% vs. 2.6%, $p=0.008$), and smaller MLA ($6.7 \pm 1.6\text{mm}^2$ vs. $13.6 \pm 4.1\text{mm}^2$, $p<0.001$). Receiver operating characteristic curve demonstrated that CTO and MLA $<8.51\text{mm}^2$ could predict early occlusion with 84.6% sensitivity and 100% specificity (AUC=0.96).

(Conclusion) CTO, in-stent lesion, and small MLA were the good predictors of early occlusion after DCB treatment in FP lesion.

MO-36 The difference of one-year late lumen loss between high dose and low dose paclitaxel coated balloons for femoropopliteal disease

○Kenji Kodama¹⁾, Yoshimitsu Soga²⁾, Nobuaki Sakai²⁾, Kazuaki Imada²⁾, Seichi Hiramori²⁾, Yusuke Tomoi²⁾, Kenji Ando²⁾, Yoshihisa Nakagawa¹⁾

¹⁾Department of Cardiovascular Medicine, Shiga University of Medical Science,

²⁾Kokura Memorial Hospital

【What's known?】

Although a recent randomized clinical trial demonstrated non-inferiority of low-dose PCB for high-dose PCB in terms of the efficacy endpoint, it was remained unclear whether high-dose PCB was superior to low-dose PCB in actual clinical practice.

【What's new?】

This retrospective clinical study investigated the difference of one-year late lumen loss (LLL) between the high dose (IN.PACT Admiral) and low dose (Lutonix) paclitaxel coated balloon (PCB). Sixty-one patients with sixty-five de novo femoropopliteal lesions who underwent PCB angioplasty at our hospital between May 2014 and March 2020 and then got one-year follow-up angiography were enrolled. Consequently, LLL was significantly lower in the high-dose PCB group (0.32 ± 0.92 mm) than in the low-dose PCB group (1.24 ± 1.01 mm) ($P = 0.001$). Moreover, negative LLL was only observed in HD-PCB group (34.1% vs. 0%, $P = 0.005$).

	High-dose-PCB (N=44)	Low-dose-PCB (N=21)	P value
Pre-procedure			
Lesion length (mm)	160.3±66.6	117.2±69.1	0.02
Reference vessel diameter (mm)	5.19±0.75	5.24±0.63	0.78
Post-procedure			
MLD (mm)	4.20±0.67	4.31±0.67	0.53
One-year follow-up			
MLD (mm)	3.88±1.08	3.07±0.96	0.004
LLL (mm)	0.32±0.92	1.24±1.01	0.001
Negative LLL (%)	15 (34.1)	0 (0.0)	0.006
CLTI group	N=4	N=7	
Post-procedural MLD (mm)	4.50±0.69	4.19±0.80	0.16
One year follow-up MLD (mm)	4.66±0.73	3.02±0.59	0.04
LLL (mm)	-0.15±0.62	1.17±0.47	0.16

Data are shown as mean ± SD or n (%).

MLD, the average of 10 subsegmental minimum lumen diameters

LLL, the MLD after EVT minus the MLD at 1 year follow up

MO-37 The Successful Endovascular Recanalization Procedure with Wingman catheter system for Femoropopliteal Artery Total Occlusion

○Tomofumi Tsukizawa
Kishiwada Tokushukai Hospital

【What's known?】

Treatment of chronic total occlusion (CTO) in femoropopliteal artery is still challenging. The Wingman catheter system is a device for CTOs penetration with nitinol/stainless bevel tip. Previous study reported high crossing rates. But there is not real-world data.

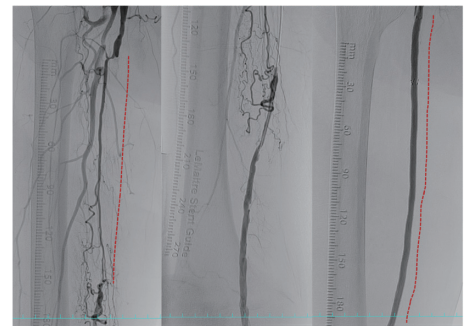
【What's new?】

This time, we evaluated Wingman using for the CTOs in femoropopliteal artery.

This study was single center and retrospective study. We analyzed consecutive 27 cases used of Wingman for femoropopliteal CTOs in 2021. The successful rate of Wingman CTO crossing was defined as the primary outcome. Secondary outcome was defined that the success of procedure.

The mean age was 76 and dialysis patients were 37.0%. Critical life-threatening ischemia was 59.3%. The superficial femoral artery was 92.6% and mean CTO length was 122mm. The number of successful Wingman crossing were 11/27 (40.7%) cases. All procedures were succeeded. One case each of embolism and perforation associated with the Wingman were seen, but both were bailout without major problems. A univariate analysis for Wingman crossing were performed. ISO (16.7% vs 0%, $p=0.012$) and non-severe calcification (12.5% vs 50.0%, $p=0.036$) were remained as the successful factor.

In conclusion, real-world data of Wingman was evaluated. It can be considered as one of option for femoropopliteal CTOs.



MO-38 Predictive model of 30-min wire passage during intentional central wiring for occlusive femoropopliteal lesions

○Yohsuke Honda, Shinsuke Mori, Takahide Nakano, Kohei Yamaguchi,
Shigemitsu Shirai, Masafumi Mizusawa, Kenji Makino, Toshiki Chishiki,
Masakazu Tsutumi, Norihiro Kobayashi, Masahiro Yamawaki, Yoshiaki Ito
Saiseikai Yokohama-city Eastern Hospital

【What's known?】

Central wiring was reported to prevent severe dissection after intervention for occlusive femoropopliteal (FP) lesions, but it often took time. Factors associated with delayed wire passage during central wiring for occlusive FP lesions were not fully elucidated.

【What's new?】

This single-center observational study (derivation group $n=198$, validation group $n=98$) was performed to create scoring model to predict 30-min wire passage during intentional central wiring for occlusive FP lesions using the beta regression coefficient model of angiographic predictors. Average wire passage time was 45 ± 46 minutes. 30-min wire passage was achieved in 49%. After multivariate analysis, 30-min wire passage was negatively predicted with proximal cap type (blunt vs taper), no-contrast staining in occlusive segment, PACCS 4, occlusive length >150 cm and distal lumen diameter <4 cm. The predictive value of this model (ranged from 0 to 15) in validation group was very high (AUC 0.87). Angiographic findings predict 30-min wire passage during intentional central wiring for occlusive FP lesions. Prompt introduction of bidirectional approach may be useful to achieve speedy central wiring in case delayed wire passage expected.

MO-39 Clinical outcomes of the Gore Excluder iliac branch endoprosthesis (IBE) for Japanese patients with aortoiliac aneurysms

○Yukihisa Ogawa

St. Marianna University School of Medicine

Purpose: To evaluate the clinical utility of the Gore Excluder iliac branch endoprosthesis (IBE) for Japanese patients with aortoiliac aneurysms.

Materials and Methods: This was a multicenter retrospective cohort study (J-PELVIS Registry). Between August 2017 and June 2020, 141 patients (mean age: 76.2 years, 77% male) undergoing endovascular aortic repair with 151 IBE implantations were enrolled. The 151 IBE implantations were divided into two groups according to the distal internal iliac artery (IIA) landing sites (group A, 132 IIA trunk group; group B, 19 IIA branch group). The primary endpoints were technical success, occurrence of IBE-related complications, and reinterventions. Secondary endpoints were mortality, aneurysm size change, and reintervention during follow-up. Technical success was defined as accurate deployment of the IBE without type Ib, Ic, or III endoleaks on the IBE sides on completion angiography.

Results: Among 141 patients, 57 (40.4%) had at least one instruction for use violation. Mean maximum and proximal common iliac artery (CIA) diameters were 32.9 ± 9.9 mm and 20.5 ± 6.9 mm, respectively. The mean CIA length was 59.1 ± 17.1 mm. The IIA landing diameter and length in group B were significantly smaller (9.2 ± 2.2 mm vs. 8.1 ± 3.0 mm, $P=0.004$) and shorter (34.8 ± 13.1 mm vs. 28.2 ± 22.3 mm, $P=0.006$), respectively, than those in group A. The overall technical success rate was 96.7%. There were no significant differences in IBE-related complications (3.0% vs. 5.3%, $P=0.86$) or IBE-related reinterventions (1.5% vs. 5.3%, $P=0.33$) between groups A and B. The mean follow-up period was 635 ± 341 days. The all-cause mortality rate was 5.0%. There were no aneurysm-related deaths or ruptures during the follow-up. Most patients (95.7%) had sac stability or shrinkage.

Conclusion: The Gore Excluder IBE was safe and effective for Japanese patients in the mid-term. Extending the IIA device into the distal branches of the IIA was acceptable, which may permit extending indications for endovascular aortic aneurysm repair of aortoiliac aneurysms to more complex lesions.

MO-40 Calcium channel blocker use was related to positive outcomes after endovascular treatment

○Daisuke Ueshima

Kameda Medical Center

【What's known?】

PAD symptoms are due to deficient blood flow via poor distal circulation. Calcium channel blocker (CCB) dilates distal arteries, but few studies evaluate their efficacy as adjunctive medical therapy for EVT.

【What's new?】

Methods

Through a consecutive EVT registry of 2,239 cases, we performed three stages of propensity score matchings between patients who received CCB and those who did not, and accounting for PAD severity, creating the following three cohorts: "adjusted whole (aWhole)," "adjusted intermittent claudication (aIC)," and "adjusted CLI (aCLI)." The primary endpoints were major adverse cardiac and cerebrovascular events (MACCE, a composite endpoint of all death, nonfatal myocardial infarction, and nonfatal stroke), and major adverse limb event (MALE, a composite of major amputation, acute limb ischemia, and surgical reintervention).

Results

Received CCB had superiority on MALE in aWhole (HR0.41), and on MACCE and MALE in aCLI (HR 0.66 and 0.39) compared to the group that did not receive CCB. Furthermore, MACCE in aWhole (HR 0.81), and MACCE and MALE in aIC (HR 0.90 and 0.89) showed no significant differences.

Conclusions

CCB use was related to fewer MACCE and MALE events in adjusted patients who underwent EVT, and the trend was more evident, especially in the adjusted CLI cohort.

MO-41 Impact of Residual SYNTAX Score of Coronary Artery Disease in Patients with Peripheral Arterial Disease after Endovascular Treatment in I-PAD-5-years-Registry

○Yusuke Kanzaki
Shinshu University

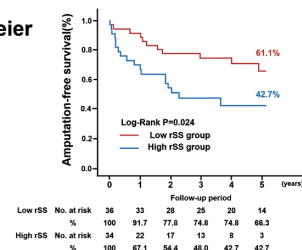
【What's known?】

Background: Coronary artery lesion is likely complex in that of PAD patients, and sometimes complete revascularization (CR) is difficult. Although the residual SYNTAX score, as a method to quantify incomplete revascularization after PCI, was predictor of cardiovascular events in patients with CAD after PCI, there are no reported that prognostic significance of rSS in PAD patients with CAD.

【What's new?】

Purpose: To reveal the target value of residual SYNTAX score (rSS) of CAD in PAD patients, and the association of rSS with long-term amputation-free survival (AFS). **Methods:** Between August 2015 and July 2016, 366 consecutive patients who underwent EVT were enrolled in the I-PAD registry from 11 institutes in Nagano. After excluding patients with CR and without CAD, we recruited 70 patients (mean age, 73.8 ± 9.6 years; male, 81.4%), and divided them into two group by ROC analysis ($AUC=0.66$ $p<0.026$): higher rSS group ($N=34$; $rSS >6$) and lower rSS group ($N=36$; $rSS \leq 6$). **Result:** During a median follow-up of 3.3 years, in Kaplan-Meier analysis, AFS was significantly lower in higher rSS group than lower (Fig). **Conclusion:** Residual SYNTAX score after EVT associates significantly with AFS in PAD patients, and rSS = 6 is a useful target for CAD of PAD patients who underwent PCI.

Kaplan-Meier Analysis for AFS



MO-42 Drug coated balloon angioplasty versus stent implantation for femoropopliteal artery disease in patients with chronic limb ischemia

○Kota Mizutani¹⁾, Keiichi Hishikari¹⁾, Yasutaka Yamauchi²⁾, Tatsuki Doijiri³⁾, Kazuki Tobita⁴⁾, Shinsuke Mori⁵⁾, Hiroyuki Hikita¹⁾, Atsushi Takahashi¹⁾

¹⁾Yokosuka Kyosai Hospital, ²⁾Takatsu General Hospital, ³⁾Yamato Seiwa Hospital,

⁴⁾Shonan Kamakura General Hospital, ⁵⁾Saiseikai Yokohama City Eastern Hospital

【What's known?】

Little is known about the superiority of drug coated balloon (DCB) angioplasty versus stent implantation for femoropopliteal artery disease in patients with chronic limb ischemia (CLI). The aim of this study is to evaluate primary patency of endovascular therapy (EVT) for femoropopliteal artery disease in patients with CLI.

【What's new?】

This study analyzed data from LANDMARK registry (evaluation of clinical outcome After endovascular therapy for femoropopliteal Artery disease in Kanagawa), which associated with 5 cardiovascular centers in Kanagawa Prefecture. From June 2017 to June 2020, consecutive 510 patients with CLI underwent EVT for femoropopliteal artery disease. Based on finalized devices of EVT, these patients were divided into 2 groups, DCB angioplasty ($n = 186$) and stent implantation ($n = 324$). We measured incidence of major adverse limb events (MALE), composed of repeated restenosis, target lesion revascularization, major amputation, and bypass surgery.

Median follow-up period was 18 months. Kaplan-Meier analysis showed incidence of MALE at 12 months was no significant difference between 2 groups (DCB angioplasty; 22.2%, stent implantation; 22.6%, $p = 0.89$).

MO-43 Successful endovascular intervention with PIERCE and inner PIERCE technique for severely calcified lesions of tibial artery

○Tatsuro Takei

Tenyokai Central Hospital

【Case overview】

A 66-year-old male on hemodialysis was admitted due to chronic limb-threatening ischemia. Duplex scans revealed stenosis of left iliac artery and below-the-knee (BTK) lesions with severe calcifications. After reconstruction of iliac artery, we attempted to perform endovascular therapy (EVT) for BTK lesions.

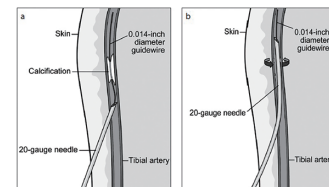
【Procedure summary】

We performed EVT via the antegrade ipsilateral femoral approach using 5Fr-guiding sheath. Pre-angiogram of BTK arteries showed three vessel occlusion. After treatment of peroneal artery (PA), we tried to recanalize anterior tibial artery (ATA). Although passage of the 0.014 inch-guidewire was obtained, sufficient lesion expansion was not achieved due to severe calcification. Crosser system was not effective, so we applied PIERCE and inner PIERCE technique (Figure) to severely calcified BTK lesions. These techniques provided sufficient dilation of ATA with a 3 mm long balloon. The final angiogram showed optimal blood flow of ATA and PA.

【Clinical time course and implication (or perspective)】

His ischemic pain has improved and good granulation is noted. Tibial arterial lesions with severe calcification may benefit from intravascular and extravascular cracking with a puncture needle.

Inner PIERCE technique



MO-44 The novel guidewire externalization technique using a needle without inserting microcatheter

○Masanaga Tsujimoto

Sapporo Cardio Vascular Clinic

【What's known?】

The success rate of endovascular procedures has improved with the advancement of devices. However, antegrade device crossing might fail due to calcification. Although guidewire externalization is one of the solutions, retrograde devices to externalize the guidewire may be inserted difficultly in small vessels. To solve this problem, we propose the “needle rendezvous” technique (NRT), which is a method of guidewire externalization by puncturing distal lumen with a needle to target antegrade wire that successfully crossed lesions and advancing the guidewire directly through the needle hole and out of body. This study aimed to investigate the safety and efficacy of NRT.

【What's new?】

We retrospectively reviewed 12 patients using NRT at our hospital between August 2020 and February 2022. The main endpoints were the success rate of guidewire externalization with NRT, procedure success, and the incidence of complications. Consequently, the mean procedure time from puncture to establish guidewire externalization was 5.3 ± 2.4 minutes. Guidewire externalization with NRT and procedure success to obtain a sufficient blood flow were achieved in 100%. No complications such as hemorrhage and vessel injury occurred. NRT is a safe and useful technique for successful guidewire externalization in cases which delivery of antegrade devices is difficult by conventional technique.

MO-45 Successful endovascular treatment with a SFA-POP double CTO via contralateral crossover approach by OTW IVUS-guided wiring

○Hiroshi Mikamo, Shoya Nonaka, Shunsuke Todani, Takuro Ito, Shuji Sato,
Takuo Iizuka

Toho University Sakura Medical Center

【Case overview】

An 85-year-old woman was referred to our hospital by her primary care physician for the left dorsal ulceration. Ankle brachial blood pressure index couldn't be measured on the left side. Contrast CT showed stenosis of the left common iliac artery (CIA), occlusion from ostium of the left superficial femoral artery (SFA) to the proximal of popliteal artery (POP), occlusion from mid of the left POP to the tibioperoneal artery trunk (TpT). We planned endovascular therapy for CIA stenosis, SFA-TpT double CTO via contralateral crossover approach simultaneously.

【Procedure summary】

To enhance backup, 6Fr guide catheter was used in 6Fr guiding sheath, 0.018inch Gladius was used with OTW IVUS (Reconnaissance PV). Gladius was successfully passed to the end of the left posterior tibial artery (PTA) antegradely, although the course was corrected during the process, by confirming that the wire was in the intraplaque in real time by IVUS. Jupiter SFA was passed through occlusion of the left ATA with Crusade PAD. Below the knee lesion were dilated with Coyote, SFA-POP lesion was dilated with drug-coated balloon. Self-expandable stent was deployed to the left CIA.

【Clinical time course and implication (or perspective)】

By using Reconnaissance PV, complete revascularization of all lesions, including double CTO, was achieved by a contralateral crossover approach.

MO-46 Percutaneous deep venous arterialization with balloon angioplasty saved a life-threatening critical limb in a hemodialysis patient after repeated pedal angioplasty failed

○Tomonari Takagi, Akira Miyamoto, Ryouji Kuhara, Takako Akita, Masahiro Fukuda,
Yasutaka Yamauchi

Takatsu General Hospital

【Case overview】

A 55-year-old man with diabetes mellitus and end-stage renal failure on maintenance hemodialysis, was referred to our hospital because of gangrene of the second and third toes of his left foot.

【Procedure summary】

Endovascular treatment was repeated for the anterior tibial artery, posterior tibial artery, dorsal foot artery, and plantar artery lesions, but revascularization below the ankle was unsuccessful. Since the infection had spread to the soles of the foot, below-the-knee amputation was indicated, but the patient refused. Therefore, we performed pDVA to the left PTA simultaneously with Lisfranc amputation. An arteriovenous fistula was created at the ankle joint with the venous arterialization simplified technique and a guidewire was penetrated into the plantar vein. Balloon dilatation from the PTA to the plantar vein was performed to complete pDVA.

【Clinical time course and implication (or perspective)】

Although repeated EVT was required to maintain blood flow in the pDVA, the skin grafting was performed 3 months after the pDVA, and the wound completely healed and he was discharged 6 months after the DVA. The pDVA can be a one option to limb salvage for no-option CLTI patients facing imminent amputation.

MO-47 Endovascular repair for abdominal aortic aneurysm with iliac chronic total occlusion using bifurcated endoprosthesis device

○Keisuke Kamada, Masami Shingaki, Keitaro Nakanishi, Kazunori Ishikawa,
Atsuhiko Koya, Kiyohumi Morishita

Hakodate Municipal Hospital

【What's known?】

Endovascular aneurysm repair (EVAR) for abdominal aortic aneurysm (AAA) with chronic total occlusion (CTO) of iliac artery can be accomplished by aortouni-iliac (AUI) graft with femoro-femoral crossover bypass, but it has problems associated with extra-anatomical reconstruction. Endovascular treatment for CTO enables anatomical reconstruction using bifurcated endoprosthesis. This study aimed to analyze the outcome of EVAR for AAA with CTO of iliac artery.

【What's new?】

This study was a retrospective single-center analysis. Between January 2017 and October 2020, 325 patients underwent EVAR, and 8 patients (2.5%) of them with CTO lesion of iliac artery were enrolled in this study. The intraoperative and postoperative factors were reviewed.

The mean CTO lesion length was 74.4 ± 60.1 mm. All patients underwent intravascular ultrasound for confirming true lumen after crossing CTO. Technical success was achieved in 7 patients (87.5%), and unsuccessful case was converted to AUI stentgraft. The 30-day mortality and major complication rates were 0%. The mean follow-up periods were 19.6 months, and graft patency rate was 85.7%. The ankle-brachial index improved significantly from 0.61 ± 0.07 in preoperatively to 0.98 ± 0.22 in postoperatively ($p < 0.01$).

The outcome of EVAR using bifurcated graft for AAA with iliac CTO lesion was acceptable.

MO-48 A case of two-stage EVT for thrombotic lesion in the aortoiliac region

○Shunsuke Maruta

Mito Medical Center

【Case overview】

The case was a 72-year-old man. He admitted bilateral intermittent claudication, but he was watching. On the 33rd day of hospitalization for pneumonia, poor color tone of the left toe appeared, and ABI: R = 0.61 / L = 0.53. CTA revealed occluded lesions in the left CIA-EIA and diffuse stenotic lesions in the left SFA.

【Procedure summary】

We decided to perform EVT for left CLTI, and used Destination Slender 119 cm from the left radial approach. The passage of GW in left iliac lesions was relatively smooth, and IVUS was performed, there were thrombotic lesions. When POBA was performed with a 6 mm diameter balloon, distal embolism was happened in the left CFA, so we refrained from stent deployment on the same day, and as a policy to perform EVT in the second stage.

3 days after heparinization, We deployed stent graft from left CIA to EIA and DES for left SFA.

【Clinical time course and implication (or perspective)】

Postoperative ABI normalized from 0.53 to 0.92, leading to toe rescue. We report the usefulness of the radial approach in the aortoiliac region and a case in which EVT was performed in two stages for thrombotic lesions and a favorable course was obtained.

MO-49 Comparative two-year outcomes of Misago stent versus other bare nitinol stents for denovo aortoiliac disease

○Takuya Haraguchi, Masanaga Tsujimoto, Tsuyoshi Takeuchi, Tsutomu Fujita
Sapporo Heart Center

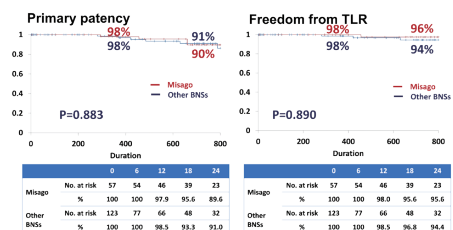
【What's known?】

No trials have compared the Misago stent to other bare nitinol stents for patients with aortoiliac (AI) lesions.

【What's new?】

The retrospective, a single center, observational study (n=180) compared the two-years clinical outcomes between Misago stent (n=57) and other bare nitinol stents (BNS; n=123) implantation for denovo AI lesions. Procedure success was 100% and no procedure related complications occurred. Consequently, the two-years primary patency of Misago and BNS were 97.9% and 89.6% versus 98.5% and 91.0% at one and two years (p=0.883), and freedom from target lesion revascularization (FFTLR) of both groups were 98.0% and 95.6% versus 98.5% and 94.4% at one and two years (p=0.890), respectively. After a propensity score matching analysis to adjust the backgrounds between both groups, there were no significant difference in the primary patency (Misago; 100%, 96.5%, other BNS; 100%, 95.6%, p=0.890) and FFTLR (Misago; 100%, 96.5%, other BNS; 100%, 94.4%, p=0.854) at one and two years

In conclusion, this study demonstrated that the treatment with Misago stent for denovo AI lesions was non-inferior to other BNSs implantation strategies after propensity score matching analysis.



MO-50 The needle re-entry technique for infrainguinal arterial calcified occlusive lesions

○Takuya Haraguchi, Masanaga Tsujimoto, Tsuyoshi Takeuchi, Tsutomu Fujita
Sapporo Heart Center

【Case overview】

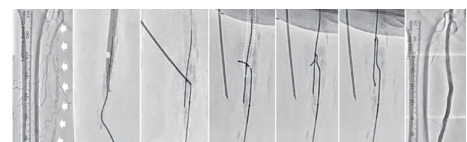
A 73-year-old female with severe claudication in her right calf with ankle brachial index of 0.62, and a computed tomography angiogram showed a long occlusion with diffuse calcification in superficial femoral artery.

【Procedure summary】

Since the calcified vascular wall of the lesion prevented the successful re-entry, the needle re-entry was performed. First, a retrograde puncture was performed to establish a retrograde fashion. Second, an antegrade 5.0-mm balloon was advanced into a subintimal plane and balloon dilation was maintained. Third, an 18-gauge needle was antegradely inserted from distal thigh to the dilated balloon. After confirming a balloon rupture by the needle penetration, the needle was further inserted to meet the retrograde guidewire tip. Then, a retrograde guidewire was advanced into the needle hole. After further guidewire advancement, the needle was removed. Finally, since the guidewire was passing through the 5.0-mm ruptured balloon, the balloon was withdrawn, and the guidewire was caught with the balloon and successfully advanced into the antegrade subintimal space. After guidewire externalization, an endovascular stent graft and an interwoven stent were deployed to cover the lesion, and angiography showed a satisfactory result without complications.

【Clinical time course and implication (or perspective)】

No restenosis, reintervention, and limb loss have been observed for one year follow-up period.



MO-51 Cook Zenith endograft and early sac shrinkage, which is associated with fewer serious complications after endovascular aneurysm repair

○Shuta Ikeda, Tomohiro Sato, Yohei Kawai, Takuya Tsuruoka, Masayuki Sugimoto, Kiyooki Niimi, Hiroshi Banno

Division of Vascular Surgery, Department of Surgery, Nagoya University Graduate School of Medicine

In a study of 553 post-EVAR patients, patients with sac shrinkage at one year had a significantly reduced incidence of serious complications ($p<0.001$). The predictors of early sac shrinkage were the use of Zenith endografts, chronic kidney disease and 5 or more patent lumbar arteries. The use of endografts that are more likely to result in sac shrinkage at one year after surgery, such as Zenith, may be able to obtain better long-term outcomes.

MO-52 Early and late outcomes of endovascular treatment for internal iliac artery aneurysm

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The Sakakibara Heart Institute of Okayama

【What's known?】

Surgical repair for internal iliac artery aneurysm (IIAA) is technically challenging because it locates deep in the pelvis. In contrast, endovascular treatment for internal iliac artery aneurysm (EVIAR) is less invasive and associated with better short-term outcomes than open repair. However, its long-term outcomes are still unclear.

【What's new?】

In the present study, consecutive 31 patients undergoing EVIAR consisted of endograft placement and coil embolization from December 2009 to December 2015 were retrospectively reviewed. 34 IIAs were enrolled. No early endoleaks were identified. There was no early complication except for buttock claudication which occurred in 4 of 24 (16.7%) patients who were able to walk unassisted. No aneurysm rupture, endograft migration and occlusion were observed with a mean follow-up 4.9 years (range, 0.1 to 11.7 years). Aneurysmal diameter was decreased in 19 (57.6%), stable in 11 (33.3%), and increased in 3 (9.1%). Three late endoleaks were detected (type II; 2, type V; 1). EVIAR is considered safe method and the long-term outcomes were acceptable. However, buttock claudication and late endoleaks occurred in some cases.

MO-53 Long term clinical outcome of endovascular therapy for aortoiliac artery in-stent restenosis lesions

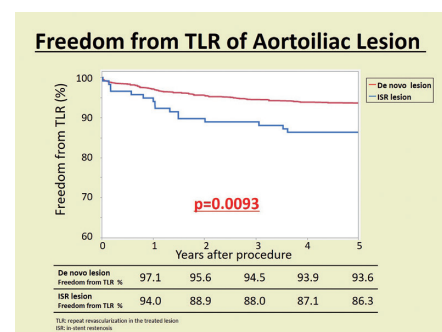
○Akiko Tanaka, Kazunori Horie
Sendai Kousei Hospital

【What's known?】

BACKGROUND: Poor results of endovascular therapy (EVT) for femoropopliteal in-stent restenosis (ISR) lesions were reported. On the other hand, there were few data of additional EVT for aortoiliac artery (AIA) ISR lesions.

【What's new?】

OBJECTIVE: This study aimed to investigate the clinical outcome of the AIA ISR lesion. METHODS & RESULTS: This study was a single-center, cohort study. Between January 2007 to June 2021, we treated 1574 de novo AIA lesions by EVT. One hundred seventeen of them needed additional EVT due to ISR and we studied these ISR lesions. Twenty-eight lesions were in-stent occlusion (ISO) and 72 lesions were performed adjunctive stenting. Mean follow-up period was 1657 days and during follow-up period, 16 lesions needed repeat revascularization for the treated lesion (TLR). Freedom rates from TLR, comparing with the de novo lesions, were significantly poor (log-rank $p=0.0093$, show in the Fig). Predictors of TLR were ISO ($p=0.001$) and small diameter ($< 8\text{mm}$) of primary stent ($p=0.004$). Overall, adjunctive stenting was not affected to TLR ($p=0.12$). CONCLUSION: Clinical outcome of AIA ISR lesions was also poor.



MO-54 Clinical Impact of Additional Cilostazol Treatment on Restenosis Risk following Heparin-Bonded Stent-Graft Implantation

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¹⁾Shonan Kamakura General Hospital, ²⁾Osaka University Graduate School of Medicine,

³⁾Kansai Rosai Hospital

【What's known?】

The current study sought to investigate the association of additional cilostazol treatment on the 12-month restenosis risk after femoropopliteal heparin-bonded stent-graft implantation.

【What's new?】

This study was a sub-analysis of the Viabahn stent graft placement for femoropopliteal disease reQUIring endovaScular tHerapy (VANQUISH) study, a prospective multicenter study investigating 231 limbs of 231 patients who received the Viabahn Stent-Graft (W.L. Gore & Associates, Flagstaff, AZ, USA) implantation and dual-antiplatelet therapy of aspirin and a thienopyridine. We included 56 cilostazol-treated and 175 cilostazol-free patients, and we adopted the inverse probability of treatment weighting (IPTW) method based on propensity scores. The 1-year restenosis rate was 12.4% (95 % confidence interval [CI], 3.2% to 21.7%) in the cilostazol-treated group and 24.5% (95 % CI, 18.0% to 30.9%). The odds ratio of cilostazol for the 12-month restenosis was 0.42 [0.18 to 0.98] ($P=0.046$). Diabetes mellitus, statin use, and IVUS-evaluated vessel diameter ≥ 5 mm had a significant interaction on the association of cilostazol treatment with 12-month restenosis (all $P<0.05$). The incidence rate of major amputation, surgical reconstruction, target lesion revascularization, and acute thrombotic occlusion was not different between the groups. Our study revealed the clinical impact of additional cilostazol treatment on restenosis risk following heparin-bonded stent-graft implantation.

MO-55 Prediction of Technical Failure of Inframalleolar Angioplasty in Patients with Chronic Limb-threatening Ischemia: Insight into What Makes No-option Anatomy for Endovascular Therapy

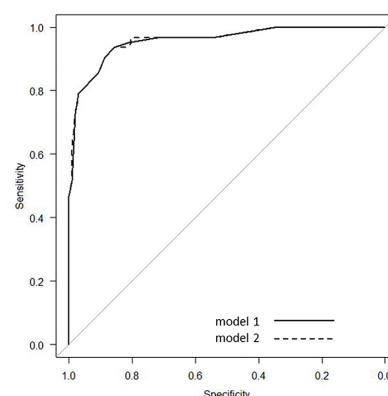
○Yusuke Sato, Tan Michinao, Takashi Miwa, Kazushi Urasawa
Tokeidai Memorial Hospital

【What's known?】

The success of endovascular inframalleolar intervention has contributed to improving lower-limb outcomes in patients with chronic limb-threatening ischemia (CLTI). However, predictors of the technical failure of inframalleolar angioplasty (IMA) remain to be identified.

【What's new?】

This single-center retrospective observational study enrolled 159 patients with CLTI who underwent IMA for *de novo* occluded lesions between November 2017 and May 2021. These patients were divided into two groups: the Failed IMA group (n=62) and the Successful IMA group (n=97). In multivariable analysis, no outflow of the target vessel (odds ratio [OR] 39.8; 95% confidence interval [CI]: 10.7-148; $p<.001$), medial artery calcification (MAC) grade (OR 4.91; 95% CI: 1.40-17.3; $p<.001$), and occluded pedal arch (OR 5.2; 95% CI: 1.2-22.7; $p=.03$) were identified as independent predictors of the technical failure of IMA. The risk prediction model had an area under the receiver operating characteristic curve (AUC) of 0.93; after bootstrapping adjustment for optimism, this value represented a corrected AUC of 0.95. Therefore, we suggest that our model will be useful for determining therapeutic strategies for CLTI patients with *de novo* inframalleolar disease.



MO-56 Clinical Impact of Combined Endovascular Balloon Inflation and Percutaneous Thrombin Injection for Any Iatrogenic Pseudoaneurysm

○Eiji Koyama, Kazuki Tobita, Hutoshi Yamanaka, Hirokazu Miyashita,
Takayoshi Yamashita, Yusuke Tamaki, Shigeru Saito
Shonan Kamakura General Hospital

【What's known?】

Background: Iatrogenic pseudoaneurysm is one of the complications of catheterization. Recently, it was reported that treatment for iatrogenic femoral pseudoaneurysms with combined endovascular balloon inflation and percutaneous thrombin injection was effective. This study purpose is to examine the efficacy and safety of treatment for iatrogenic all puncture sites' pseudoaneurysms with combined endovascular balloon inflation and percutaneous thrombin injection.

Methods: 62 of iatrogenic pseudoaneurysms patients undergoing endovascular therapy (EVT) with combined endovascular balloon inflation and percutaneous thrombin injection from September 2017 to January 2022 were retrospectively analyzed. The endpoint was defined as complete hemostasis by vessel echography after procedure. Result: The mean age was 75.0 ± 13.2 years; female patients was 54.8%. The percentage of iatrogenic pseudoaneurysms by femoral artery was 67.7%, brachial artery 22.6%, others artery 9.7%. Half of patients were taken oral anticoagulant drug. Complete hemostasis was achieved in 90.7%, and additional hemostasis succeeded with stent-graft implantation for all unsuccess cases.

【What's new?】

Conclusions: Treatment of iatrogenic pseudoaneurysms with combined endovascular balloon inflation and percutaneous thrombin injection was effective.

MO-57 A retrospective single-center study of access-related complications during percutaneous endovascular aneurysm repairs

○Ryosuke Taniguchi, Toshio Takayama, Masamitsu Suhara, Yasuaki Mochizuki,
Katsuyuki Hoshina

The University of Tokyo

【What's known?】

<Background> Vascular closure devices have enabled us to practice endovascular aneurysm repairs (EVAR) percutaneously. Since we have been choosing percutaneous access as first line since 2017 at our institution, we sought to elucidate the incidence of access-related complications during percutaneous EVAR.

【What's new?】

<Methods> Consecutive cases of EVAR performed via femoral access between 2017/8/1 to 2021/9/31 at our single institution were divided into 2 groups: patients with percutaneous access using Perclose ProGlide™ (PG) or patients with conventional “cutdown” femoral exposure (CD). Access-related complications were assessed retrospectively.

<Results> In total, 155 patients (288 groins) were included. Baseline characteristics for PG group (n=122) and CD group (n=33) were similar with age (76.7 vs 75.3, P=0.42) and male ratio (85.2 vs 75.8%, P=0.20). There was significantly decreased procedure time (130 vs 150 minutes, P=0.02), blood loss (20 vs 40 ml, P=0.02) and time to hospital discharge (3.5 vs 5.0 days, P<0.01) in PG group compared to CD group. Moreover, the rate of total access-related complications was similar (5.7 vs 3.0%, P=0.53).

<Conclusion> When performed with proper technique, percutaneous access is beneficial in terms of improved procedural and in-hospital outcomes with similar rate of access-related complications.

MO-58 Outcomes of Hybrid operation of Common Femoral Endarterectomy and Endovascular Therapy for Peripheral Arterial Disease

○Keitaro Nakanishi, Masami Shingaki, Keisuke Kamada, Kazunori Ishikawa,
Atsuhiko Koya

Hakodate Municipal Hospital

【What's known?】

Objective: Hybrid operation for peripheral arterial disease (PAD) is getting widespread. To assess outcomes of common femoral endarterectomy combined with an inflow and outflow endovascular revascularization in patients with PAD.

【What's new?】

Methods: From February 2016 to October 2021, All the patients who underwent planned one stage hybrid common femoral artery (CFA) endarterectomy combined with an inflow and/or outflow endovascular revascularization due to multilevel disease were included. Three groups were created according to the endovascular therapy zone: group 1 (inflow, n = 10); group 2 (outflow, n = 17); and group 3 (combined inflow and outflow, n = 6).

Results: The overall primary patency rate was 73.0% at 12 months. The overall CD-TLR free survival rate was 95.5% at 12 months. Patients in group 3 demonstrated a significantly lower primary patency rate than patients in group 1 (33.3% vs 100%; p=0.027).

Conclusions: The hybrid operation of common femoral endarterectomy and EVT was safe and effective. The primary patency was lower in patients who needed inflow and outflow EVT.

MO-59 Incidence, predictors, and prognostic implications for major bleeding after endovascular therapy

○Keiichi Hishikari¹⁾, Yasutaka Yamauchi²⁾, Tatsuki Doijiri³⁾, Kazuki Tobita⁴⁾, Shinsuke Mori⁵⁾, Hiroyuki Hikita¹⁾, Atsushi Takahashi¹⁾

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【What's known?】

BACKGROUND: The incidence of major bleeding after EVT, its independent predictors, and its prognostic importance in clinical practice has not been fully addressed.

【What's new?】

METHODS AND RESULTS: This study is a retrospective multicenter-registry enrolling consecutive 1378 patients (1777 lesions) treated at 5 hospitals in Kanagawa between July2017 and June2020 (evaluation of clinical outcome After endovascular therapy for femoropopliteal ARtery disease in Kanagawa:LANDMARK registry). Of these 1378 patients underwent EVT, cox proportional hazard models were used to determine factors associated with major bleeding, and to estimate risk of death associated with major bleeding. We found 134(9.7%) patients occurred major bleeding (BARC3<) in median time of 23 months follow-up, with most of bleeding episodes due to gastrointestinal bleed. The significant predictor of major bleeding was hemodialysis (HR,2.70;95% CI,1.88 to 3.88;p<0.001). All-cause mortality-free survival rate was significantly worse in patients with major bleeding group than non-major bleeding group (long-rank test $\chi^2=76.3$;p<0.001). Cox proportional hazards analysis showed major bleeding after EVT (HR, 2.44; 95% CI,1.85 to 3.23;p<0.001) was an independent predictor of all-cause death after EVT.

CONCLUSIONS: Late major bleeding after EVT is associated with substantially increased risk of death even after successful EVT. The hemodialysis is associated with the highest risk of late bleeding.

MO-60 Impact of “Black Rock” on clinical outcomes after endovascular therapy for de novo calcified femoropopliteal lesions

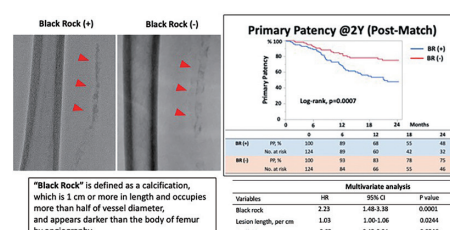
○Shinsuke Mori, Masahiro Yamawaki, Takahide Nakano, Kohei Yamaguchi, Masafumi Mizusawa, Shigemitsu Shirai, Kenji Makino, Toshiki Chishiki, Yohsuke Honda, Masakazu Tsutsumi, Norihiro Kobayashi, Yoshiaki Ito
Saiseikai Yokohama City Eastern Hospital

【What's known?】

It has been well known about the relationship between severity of calcification and clinical outcome after endovascular therapy (EVT) for femoropopliteal lesions. On the other hand, it has not been reported about the impact of “black rock (BR)” on that.

【What's new?】

We defined BR as a calcification, which is 1 cm or more in length and occupies more than half of vessel diameter, and appears darker than the body of femur by angiography. We retrospectively analyzed 677 lesions of 495 patients who underwent EVT for de novo calcified femoropopliteal lesions between April 2007 and June 2020 at our hospital. Propensity score-match analysis was performed to compare the clinical outcome between BR (+) and BR (-). A total 124 matched pairs of lesions were analyzed. Primary patency at 2 year is significantly lower in BR (+) group than BR (-) group (48% vs. 75%, p=0.0007). Multivariate analysis revealed BR [hazard ratio (HR)=2.23, 95% confidence interval (CI); 1.48-3.38, p<0.0001], lesion length (HR=1.03, 95%CI; 1.00-1.06, p=0.0244), and scaffold use (HR=0.63, 95%CI; 0.42-0.94, p=0.0246) were predictors of restenosis. BR is independently associated with clinical outcome after EVT for de novo calcified femoropopliteal lesions.



MO-61 Quantitative techniques of ultrasonography in the assessment of femoropopliteal atherosclerotic lesions using peak systolic velocity ratio (PSVR) : TURN-UP study

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[What's known?]

Duplex ultrasound-measured peak systolic velocity ratios (PSVRs) are commonly used to evaluate arterial stenosis in peripheral arterial disease (PAD). However, the measuring methods have not been standardized. This study aimed to reveal the influence of the measuring methods on PSVR values.

[What's new?]

Methods

This multicenter prospective study enrolled 132 femoropopliteal lesions (132 PAD patients) with PSVR ranged from 1.5 to 3.5. The following four comparisons between differently measured PSVR values were performed: 1) the angle correction (AC) of 60° versus 45°; 2) AC of 60°, with the reference point fixed on the normal area vs 2cm proximal or distal to the lesion area; 3) AC of 45° or 60°, with the reference point fixed on the normal area vs the lowest peak systolic velocity area; 4) AC of 45° or 60°, with AC measured along the flow vs vessel. The difference of PSVR values was analyzed by the Bland-Altman method.

Results

The 95% prediction intervals of the difference in PSVR measurements were 1) -0.64~+0.53, 2) -1.12~+0.79, 3) -0.70~+0.79 and -0.77~+0.91, and 4) -0.37~+0.43 and -0.59~+0.68, respectively

Conclusion

PSVR values were largely dependent on the measuring methods, which would considerably affect the judgement of arterial stenosis

MO-62 Endovascular bypass for salvage of failing vascular access in hemodialysis patients

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Shin Kong Wu Ho-Su Memorial Hospital

[What's known?]

Purpose: This study was performed to retrospectively assess the efficacy of percutaneous creation of an intravascular bypass with stent graft deployment (endovascular bypass) for salvage of failing vascular access in hemodialysis patients.

Methods: Salvage of abandoned vascular access sites was attempted in 5 patients with failing vascular dialysis access. These vascular access were salvaged using endovascular bypass techniques by using covered stent to create a new bypass grafting to bypass the stenosis. The postintervention primary, assisted primary, and secondary patency rates of the access site and bypass were calculated using the Kaplan-Meier method.

Results: The procedural and clinical success rates were both 100%. The postintervention primary patency rate of the bypass and access site at 360 days was acceptable. The mean follow-up period was over two years. No major complications were observed.

[What's new?]

Salvage of abandoned vascular access sites for hemodialysis patients can be technically feasible and clinically successful using endovascular bypass techniques in selected patients when surgical revision is not considered or is not possible. Compared to surgical bypass, the technique will preserve the original vascular access, prevent any use of temporary dialysis catheter and reduce the surgical complications.

MO-63 Clinical features and outcomes of endovascular therapy for postpancreatectomy hemorrhage: A multicenter, retrospective, observational study

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Sumitomo Hospital

Objectives: Endovascular intervention is widely adopted as a first-line treatment option for postpancreatectomy hemorrhage (PPH) which is one of the most fatal complications after pancreatic resection. However, there have been few publications on the results of endovascular therapy for PPH due to the low incidence. The aim of this study is to evaluate the safety and long-term outcomes of endovascular treatment for PPH in a multicenter data set.

Materials and Methods: A total of 117 patients with 144 endovascular interventional procedures performed for late PPH between January 2010 and January 2021 were enrolled at 8 institutions in Japan. The age of the patients was 70.0 years old, and 22 patients were female gender. The primary endpoints were technical success and secondary endpoints comprised overall survival and rebleeding.

Results: The clinical follow-up period was 898.3 days. PPH occurred 24.6 days after surgery, and 41.0% of them were accompanied with sentinel bleeding. Technical success of endovascular procedures was achieved in 94.0%. The overall survival rate at 1, 12, 24 and 36 months were 90.6%, 72.5%, 57.6% and 51.1%, respectively. The freedom from rebleeding rate at 1 month and after 12 months showed 77.5% and 75.4%, respectively. The significantly poorer overall survival was demonstrated in the rebleeding group compared to non-rebleeding group ($p=0.0175$). The neoadjuvant therapy group revealed the significantly more frequency of rebleeding than upfront surgery group ($p=0.013$).

Conclusion: While endovascular treatment for PPH is feasible to achieve hemostasis, attention should be paid to rebleeding which is associated with the poor overall survival rate especially in cases where neoadjuvant therapy was introduced.

MO-64 Ultrasound-guided versus Conventional MANTA Vascular Closure Device Deployment after Transcatheter Aortic Valve Replacement

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²⁾Department of Cardiology, Shonan Kamakura General Hospital

【What's known?】

MANTA vascular closure device (VCD) demonstrated an acceptable complication rate in several retrospective studies but did not show superiority to the suture-based VCD in randomized studies. In addition to that, as to MANTA VCD, technical solutions to reduce complications have been scarcely proposed. Only one small study showed ultrasound-guided MANTA (US-MANTA) technique reduced vascular complications (VCs) compared to without ultrasound guidance (conventional MANTA [C-MANTA]).

【What's new?】

This retrospective registry-based study ($n=1150$) compared the access-site related VCs following transcatheter aortic valve replacement (TAVR) between C-MANTA ($n=335$) and US-MANTA ($n=815$). Access-site related VC occurred in 12.5% in the C-MANTA group and 6.8% in the US-MANTA group ($p=0.0013$). In the multivariate analysis, US-MANTA was the negative predictor of developing access-site related VCs (Odds ratio: 0.57, 95% confidence interval: 0.36-0.89, $p=0.0131$). However, subgroup analysis showed the efficacy of the ultrasound-guided technique was limited to the patients without severe-calcified puncture site ($P_{\text{interaction}}=0.0475$). Consequently, the US-MANTA technique was an effective strategy to reduce VCs following transfemoral TAVR compared to C-MANTA but did not reduce VCs for patients with severely calcified puncture sites.

MO-65 Nitinol Stent Failure in Iliac Compression Syndrome

○Kei Sato, Toru Sato, Yoshito Ogihara, Kaoru Dohi

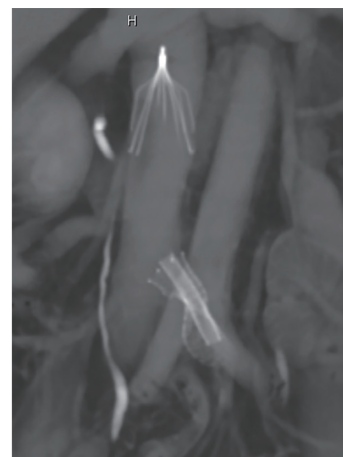
Mie University Hospital

【Case overview】

A 41 years old man was transferred to the emergency department for right hip dislocation after head-on collision. One week after non-invasive reduction, his left leg swelled, and he was diagnosed as non-massive pulmonary embolism with left iliac vein thrombosis with ultrasound and CT. Administration of urokinase and heparin relieved pain but was not effective for residual thrombosis and leg swelling. The patient was referred for further treatment.

【Procedure summary】

Catheter directed thrombolysis (CDT) and inferior vena cava filter (IVCF) placement was conducted on day 0 and 2 nitinol stent was deployed in left iliac vein on day 5. CDT was discontinued on day 6, though venography on day 7 revealed left iliac vein re-occlusion and CDT was resumed. As thrombotic occlusion was found with venography on day 9, impaired stent expansion was suspected and identified with intravascular ultrasound. Stronger compression strength was demanded and Supera stent was deployed in focal compression lesion.



【Clinical time course and implication (or perspective)】

Leg swelling was relieved and left vein was patent with CT 3 days after the procedure. This is an unusual case of nitinol stent failure in iliac compression syndrome.

MO-66 A comparison between surgical and percutaneous treatment for vascular access occlusion

○Yoshihiko Chono, Kota Shukuzawa, Hiromasa Tachihara, Masayuki Hara, Takeshi Baba, Hirotsugu Ozawa, Makiko Omori, Ryosuke Nishie, Hiroyuki Suzuki, Takao Ohki

The Jikei University School of Medicine, department of Surgery, division of Vascular Surgery

Percutaneous approach is becoming a popular treatment for vascular access (VA) occlusion. We retrospectively compared the clinical outcomes between surgical thrombectomy (ST) and percutaneous treatment (PT).

Seventy-four VA occlusions (40 cases, 49 shunts), in which surgical intervention was performed between 2017 and 2021, were included. Of the 74 occlusions, 66 cases (89.2%) were arterio-venous graft occlusions. There were 23 occlusions in the ST group and 51 in the PT group. Mean operative time and mean blood loss for ST and PT were 116 vs 57min and 159 vs 20ml, respectively ($p<0.05$).

Assisted primary patency at 3 and 12 months were 92.9%/51.6% in the ST group and 52.1%/39.1% in the PT group ($p<0.05$), and secondary patency were 93.8%/63.3% in the ST group and 71.3%/55.6% in the PT group ($p=0.12$).

PT is a reasonable less invasive technique that facilitates day surgery.

MO-67 Successful case of endovascular treatment of May-Thurner syndrome complicated by arteriovenous fistula

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Fukuoka university hospital

【Case overview】

A 65-year-old male who presented with a complaint of swelling and pain in the left lower extremity due to deep vein thrombus (DVT).

【Procedure summary】

CT showed thrombus in the left common iliac vein, external iliac vein, and common femoral vein. In addition, compression of the left common iliac vein by the right common iliac artery and early staining of the left femoral vein were observed. The patient was diagnosed as DVT with May-Thurner Syndrome (MTS) complicated by lower extremity AVF. Administration of rivaroxaban was started, and the thrombus disappeared, but the left lower extremity symptoms did not improve. We decided to perform revascularization of the left common iliac vein occlusion by MTS and placed a stent in the left common iliac vein. Although the lower extremity AVF remained after Endovascular therapy.

【Clinical time course and implication (or perspective)】

The symptoms gradually improved and AVF disappeared in the contrast-enhanced CT one year after the start of treatment.

MO-68 Bi-directional EVT for iliac compression syndrome

○Jun Yoshimura, Masayoshi Kimura, Yuya Asano, Fumiaki Ito, Takaaki Ozawa,
Daisuke Ito, Akiteru Kojima, Yusuke Nakagawa, Eigo Kishita, Jun Shiraishi,
Masayuki Hyogo, Takahisa Sawada
Japanese Red Cross Kyoto Daiichi Hospital

【Case overview】

A man in his 70s had a history of treatment for cerebral contusion and subdural hematoma. He had suffered from pain and severe swelling in his left lower leg from 6 months ago, and was referred to our hospital 5 months ago. Venous ultrasonography showed obstruction from the external iliac vein (EIV) to the common iliac vein (CIV) due to a thrombus. The final diagnosis was iliac compression syndrome. Since symptoms did not improve after conservative therapy, we decided to perform endovascular treatment (EVT).

【Procedure summary】

An inferior vena cava filter was placed, and then an antegrade approach was attempted from the left common femoral vein (CFV), but IVUS-guide wiring and knuckle wiring techniques both failed due to the organized thrombus. Therefore, we added a retrograde procedure from the right CFV. Wire rendezvous was difficult, but antegrade wiring attempted again with a landmark of the retrograde wire achieved successful passage to the true lumen of the IVC. Bare metal stents were then deployed and the final angiogram showed optimal blood flow.

【Clinical time course and implication (or perspective)】

One month later, follow-up angiography showed good patency. We report this case as a rare example of EVT for iliac compression syndrome using a bidirectional approach.

MO-69 Thoracic Endovascular Aortic Repair for Type B Aortic Dissection with concurrent COVID-19 infection

○Mei Ping Melody Koo, Hansraj Riteesh Bookun
St Vincent's Hospital Melbourne

【Case overview】

66-year-old Samoan gentleman presented with acute Type B aortic dissection with end-organ malperfusion and concurrent COVID-19 infection with respiratory compromise. The entry tear was just distal to the left subclavian artery, with the dissection plane extending into bilateral common iliac arteries. The left renal artery arose from the false lumen. The maximal diameters of the descending thoracic aorta and the false lumen were 43mm and greater than 22mm. Multidisciplinary team discussion quoted operative mortality of 30% at the time.

【Procedure summary】

The patient was admitted to ICU for haemodynamic management. Decision was made to delay the procedure for one month. After the COVID-19 pneumonitis settled and received haemodialysis, he first underwent left carotid-subclavian artery bypass, followed by TEVAR with a 40mm x 20cm Gore C-Tag thoracic stent-graft, proximally landed just distal to LCCA. Operative angiogram as shown in Figure.

【Clinical time course and implication (or perspective)】

The patient had an uncomplicated recovery and was discharged home one-week after procedure. The COVID-19 pandemic has created major challenges in management of aortic emergencies. Delayed presentation, referrals and resource restrictions have been described as factors leading to poor clinical outcomes.

MO-70 The masseter muscle thickness and oral frailty is a strong predictive marker for postoperative pneumonia and midterm mortality after endovascular repair for abdominal aortic aneurysm

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The Jikei University Kashiwa Hospital

Background

Oral frailty is a decrease in oral and swallowing function, which is a risk factor for pneumonia. In the current study, we analyzed the association between masseter muscle thickness (MMT) and postoperative pneumonia and mortality after endovascular aneurysm repair (EVAR) for abdominal aortic aneurysm (AAA).

Methods

Overall, 247 patients were retrospectively evaluated. The primary endpoint was postoperative pneumonia. The MMT was measured as the maximum thickness of the masseter muscle 2 cm caudal to the zygomatic arch using computed tomography images obtained within 3 months before the EVAR. Pneumonia was defined as the presence of progressive infiltrates, consolidation, or cavitation on the imaging study and fever or leukocytosis.

Results

Twenty (8.1%) cases of postoperative pneumonia occurred within 1 year after EVAR. We found that patients with a low MMT (≤ 30 th percentile; men, 10.4 mm; women: 8.8 mm) had a significantly higher risk of developing postoperative pneumonia within 1 year after elective EVAR. A comparison of MMT and psoas muscle index (PMI) for predicting 1-, 3-, and 5-year all-cause mortality revealed that MMT had superior predictive performance.

Conclusion

The MMT before elective EVAR predicted postoperative pneumonia and life expectancy, and its predictive performance was superior to that of PMI.

MO-71 Total endovascular repair for thoracoabdominal aortic aneurysm associated with Takayasu's Aortitis

○Junki Yokota, Kazuo Shimamura, Takayuki Shijo, Koichi Maeda, Kizuku Yamashita, Ryota Matsumoto, Shigeru Miyagawa

Osaka University Department of Cardiovascular Surgery

【Case overview】

The patient was a 65-year-old female who has Takayasu's aortitis with ϕ 50mm Crawford type V thoracoabdominal aortic aneurysm (TAAA) and saccular ϕ 40mm left common iliac artery aneurysm (CIAA). She was on high-dose steroids, and given severe adhesions around the aneurysm due to aortitis in prior surgical prosthetic graft replacement for CIAA, open repair for TAAA was considered to have a significant surgical risk. Therefore, the total endovascular repair using a branch device was planned.

【Procedure summary】

The procedure was performed under general anesthesia with cerebrospinal fluid drainage. COOK thoracoabdominal branch device was used with intraoperative cone-beam CT guiding. VIABAHN VBX was delivered as bridging covered stents for visceral branches (bilateral renal artery and supramesenteric artery) from the left axillary artery. Final angiogram showed good flow for each branch and no endoleak.

【Clinical time course and implication (or perspective)】

The patient showed a satisfactory postoperative course without neurological deficit or other major complications and was discharged home on the 9th postoperative day. Aortitis was well controlled by immunosuppressive treatment in outpatient and CT 1 year after surgery revealed significant shrinkage of TAAA without endoleak and branch occlusion. Total endovascular repair of inflammatory TAAA was suggested to be a useful treatment option.

MO-72 Severe tortuosity of the distal descending thoracic aorta affects the accuracy of distal deployment during a thoracic endovascular aortic repair

○Tomohiro Sato, Shuta Ikeda, Yohei Kawai, Takuya Tsuruoka, Masayuki Sugimoto, Kiyooki Niimi, Akio Kodama, Hiroshi Banno, Kimihiro Komori

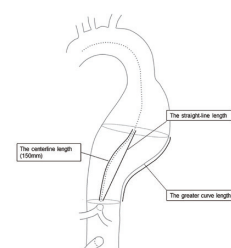
Nagoya University Graduate School of Medicine

【What's known?】

Thoracic endovascular aortic repair (TEVAR) for para-diaphragmatic thoracic aortic aneurysms requires accurate distal landing. An in vitro experiment reported the association between the tortuosity of the aorta and the inaccuracy of distal deployment in vitro experiment. It has been reported that the cases with the inaccurate distal landing was more likely to have type Ib endoleak.

【What's new?】

A retrospective CT analysis revealed that the greater curve to the straight-line ratio (G/S ratio) was associated to the malposition of the stent graft, defined as being deployed more than 10 mm away from the target vessel. Further, a comparative analysis based on the G/S ratio demonstrated that severe aortic tortuosity was associated with a more distal and tilted deployment of the stent graft.



MO-73 Mid-term result of hybrid TEVAR for Kommerell's diverticulum complicated with the right-sided aortic arch

○Satoshi Sakakibara, Kazuo Shimamura, Takayuki Shijo, Koichi Maeda,
Kizuku Yamashita, Ryota Matsumoto, Daisuke Yoshioka, Masaki Taira,
Shigeru Miyagawa

Osaka University Graduate School of Medicine

【What's known?】

Objective

We evaluated the early and mid-term outcomes of hybrid TEVAR for Kommerell's diverticulum (KD).

【What's new?】

Subject and Methods

Seven patients (mean 64.1 years old, 6 males) who underwent hybrid TEVAR for KD with the right-sided aortic arch were reviewed retrospectively. Aortic arch had acute angulation with average of 89.4° (normal arch angle 103.8°). In order to achieve at least 2 cm proximal sealing length, debranching of supra-arch vessels was performed.

Results

The debranch procedures included total debranch with sternotomy in 5/7(71%), bilateral common carotid-axillary artery bypass in 1/7(14%). Technical success was achieved in all procedure. Postoperative results showed 30-day mortality 0%, neurological deficit 0%, renal dysfunction 0%. Postoperative CT at 1 week showed no type I endoleak, however type 2 endoleak from the aberrant subclavian artery was observed in 1/7(14%) which was successfully repaired with additional embolization. In mid-term (mean follow-up 1.9 years), overall survival was 100%/3years. In follow CT, shrinkage of the KD was observed in all patients. No new endoleaks, rupture or dissection was detected.

Conclusion

Considering the satisfactory early and mid-term result, hybrid TEVAR could be an effective treatment for KD with the right-sided aortic arch.

MO-74 The efficacy of preemptive lumbar artery embolization during endovascular aortic aneurysm repair

○Akio Koyama

Ichinomiya Municipal Hospital

【What's known?】

Type II EL is often considered responsible for aneurysm sac enlargement. Preemptive embolization of IMA has been recommended, but the efficacy of preemptive lumbar artery embolization (PLAE) is still unclear. This study aimed to identify the rate of Type II EL and sac shrinkage after EVAR with PLAE.

【What's new?】

Methods: From January 2019 to February 2022, 68 patients with AAAs underwent EVAR with PLAE. The endpoints included freedom from Type II EL at 1month, and AAA sac shrinkage.

Results: The mean follow-up was 9 months (range, 0-30 months). An average of 2.4 ± 1.3 lumbar arteries (range, 1-6) per patient were occluded during EVAR. At 1 month after EVAR, Type II EL was detected in seven patients (10%), but in only one patient (3%) in the latter half of the cases. Sac shrinkage was detected in sixteen patients (35%) at 6 months, and sixteen patients (48%) at 1 year. Sac enlargement was not detected during follow-up. The mean diameter reduction was 5.3 ± 0.9 mm ($P < .001$) in all patients with follow-up data available.

Conclusions: PLAE is effective in preventing Type II EL at 1month after EVAR. Aneurysm sac shrinkage was observed in a high proportion of patients.

MO-75 Thoracic stent-grafting for type B aortic dissection: Analysis of inhibitory factors of aortic remodeling

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Hirosaki University Graduate School of Medicine

【What's known?】

Inhibitory factors of aortic remodeling after TEVAR in type B aortic dissection (TBAD) have not been completely understood.

【What's new?】

38 consecutive patients with TBAD were treated with TEVAR within 52 weeks from the onset. STS/SVS classification of operation timing was hyperacute 4, acute 18, subacute 7, chronic 9. The endpoints of this study were 1) aortic dilatation > 5mm or 2) secondary intervention in the follow-up period. The median diameter of the proximal and distal TEVAR device was 31 (range 31 -38) mm, and 29 (range 26 - 32) mm, respectively. The proximal landing zone (Zone 1, 2, 3-) was 1, 16, and 21 cases. Total descending aortic coverage was performed in 8 (21%). Type 1 endoleak was observed in 5 (13%) and was all Zone 2 landing cases. In follow-up, There was a total of 5 reinterventions. Total aortic remodeling was achieved in 29 (76%), while aortic dilatation > 5 mm was observed in 7 (18%). Cox proportional hazard analysis revealed Type1 endoleak (hazard ratio (CI) 11.2, 95% confidence interval (CI) 2.3 - 55.6), and autoimmune disease (HR 21.3, 95% CI 1.7 - 250) were strongly associated with aortic dilatation after TEVAR in TBAD.

MO-76 Endovascular repair for perigraft seroma induced by previous visceral bypass surgery and causing duodenal obstruction

○Tsutomu Doita¹⁾, Kazuo Shimamura²⁾, Takayuki Shijo¹⁾, Ryota Matsumoto¹⁾,
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【Case overview】

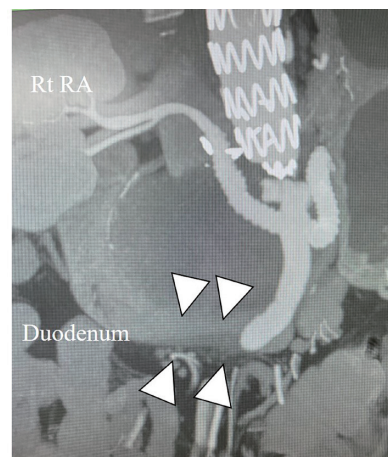
A 48-year-old man with a history of visceral debranching bypass surgery as part of hybrid thoracoabdominal aortic repair was referred to our hospital for vomiting. Enhanced computed tomography revealed duodenal obstruction due to compression by a perigraft seroma (PS) located around the bypass graft to the right renal artery (RA) (Fig 1). In consideration of the mass location and ePTFE graft material, it was speculated that the seroma had developed from this ePTFE graft. Considering the invasiveness of redo visceral bypass grafting, endovascular relining just to this ePTFE graft was performed.

【Procedure summary】

By using trans-femoral access, an 8×59-mm VBX Balloon Expandable Endoprosthesis® was deployed in the ePTFE bypassed graft to the right RA, which covered the end-to-end anastomotic part of the right RA through the crossed part of the 8-mm ePTFE and 12-mm woven graft. Post-dilation was performed using a 10-mm balloon.

【Clinical time course and implication (or perspective)】

The duodenal obstruction was immediately recovered just after the procedure, and the patient discharged from hospital at 15 postoperative day. In a three-month follow up CT, shrinkage of the seroma with size change from 95×60mm to 40×35mm was observed. Endovascular repair would be an effective option to treat PS.



MO-77 Arteriovenous Malformation Led to Critical Limb Threatening Ischemia

○Kei Sato, Akihiro Takasaki, Tairo Kurita, Kaoru Dohi
Mie University Hospital

【Case overview】

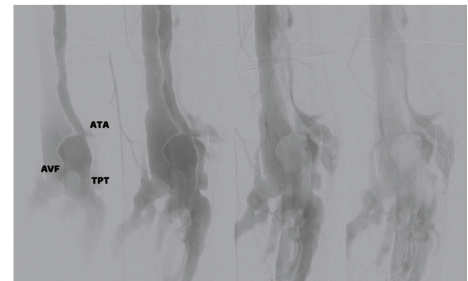
A 48-year-old woman was referred to our department for rapidly worsening left foot pain. She had feelings of strangeness in left knee in her 20s and was injured left knee by traffic accident developing edematous change when she was 30 years old. Resection of synovial osteochondromatosis was performed one year before admission. On admission, her complaint was intolerable rest pain of left toe presenting pigmentation and subcutaneous bleeding in her left forefoot and medial rearfoot. Aneurysmal arteriovenous fistula of tibioperoneal trunk and reversal flow of distal calf vein were found on Duplex ultrasound (DUS).

【Procedure summary】

To avoid tibial occlusion using covered stents, stent assisted coil embolization was conducted. Remaining some shunt flow, post-procedural DUS, ischemic assessment, and her symptom improved. Two months after the procedure, ischemic ulcer in forefoot was formed with severe rest pain. Antegrade tibial flow was not observed because of arteriovenous shunt flow and calf vein flow was reversal. Two Viabahn VBX deployments was ended in remaining leakage. Antegrade tibial arterial flow to the wound was obtained while unrecognized arteriovenous malformation lesions emerged.

【Clinical time course and implication (or perspective)】

After the procedures, toe pain was relieved and the ischemic ulcer was cured 2 months later. There are no relapses after one 1year.



MO-78 Impact of Guideline-directed Medical Therapy on 10-year Mortality after Revascularization for Patients with Chronic Limb-threatening Ischemia

○Yosuke Hata¹⁾, Osamu Iida¹⁾, Shin Okamoto¹⁾, Takayuki Ishihara¹⁾, Kiyonori Nanto¹⁾, Takuya Tsujimura¹⁾, Taku Toyoshima¹⁾, Naoko Higashino¹⁾, Mitsuyoshi Takahara²⁾, Toshiaki Mano¹⁾

¹⁾ Kansai Rosai Hospital, Cardiovascular Center,

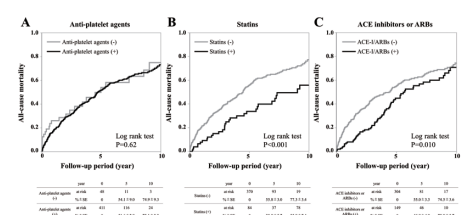
²⁾ Osaka University Graduate School of Medicine, Department of Diabetes Care Medicine

【What's known?】

On the basis of randomized trials and large meta-analyses, current guidelines recommend guideline-directed medical therapy (GDMT). However, long-term impact of GDMT on 10-year mortality in patients with chronic limb-threatening ischemia (CLTI) after revascularization is still unknown.

【What's new?】

We performed extended 10-year follow-up for 459 consecutive patients with CLTI undergoing revascularization (396 Endovascular therapy and 63 bypass surgery) between January 2007 and December 2011. The primary outcome measure was all-cause mortality, which was assessed using Kaplan-Meier analysis. We additionally explored the influence of GDMT defined as aggregate antiplatelet agents, statins, and angiotensin converting enzyme (ACE) inhibitors or angiotensin receptor blockers (ARBs) use for all-cause mortality using Cox regression hazards models. During 10 years follow-up after revascularization, 234 patients were dead. In Kaplan-Meier analysis, 10-year mortality were significantly lower in patients with statins (55.8 % versus 77.3%, $P<0.001$) and ACE inhibitors or ARBs (70.8% versus 74.5%, $P=0.010$) than those without (Figure B-C). Conversely, there were no difference in 10-year mortality between patients with anti-platelet agents and those without (73.1% versus 73.1%, $P=0.62$, Figure A). In multivariate analysis, GDMT (HR 0.75 [0.60-0.93], $P=0.009$, per one medication increase) was significantly associated with all-cause mortality.



MO-79 Impact of procedural strategies on 12-month outcomes of fluoropolymer-based drug-eluting stent implantation in contemporary femoropopliteal practice

○Sho Nakao, Osamu Iida, Mitsutoshi Asai, Shin Okamoto, Takayuki Ishihara,
Kiyonori Nanto, Takuya Tsujimura, Yosuke Hata, Taku Toyoshima,
Naoko Higashino, Toshiaki Mano
Kansai Rosai Hospital

[What's known?]

There are few reports on the restenosis factors, and especially detailed procedural factors after DES implantation have not been elucidated.

[What's new?]

Methods

We retrospectively studied 147 femoropopliteal lesions (chronic limb-threatening ischemia: 60%, TASC II C/D lesion: 65%, chronic total occlusion: 37%) in 128 patients (male: 67%, diabetes mellitus: 61%, hemodialysis: 44%) who underwent intravascular ultrasound (IVUS)-supported FP-DES implantation. We assessed whether each procedure was in compliance with the following four recommended strategies: 1) stent landing at a normal-looking position, 2) sufficient pre- and post-dilatation, 3) full-cover stenting, and 4) stent deployment not extended to the P1 segment. The association between the procedural compliance with 12-month restenosis risk was investigated.

Results

The 12-month freedom rate from restenosis, or primary patency rate was $86.5 \pm 2.2\%$ in the overall population. The restenosis risk was higher when procedures were in compliance with fewer recommended strategies; the hazard ratio relative to 4 strategies [95% confidence interval] were 7.49 [1.01-57.60] for 2 or 3 strategies and 62.13 [7.90-488.51] for 0 or 1 strategy (both $P < 0.001$).

Conclusion

Recommended procedural strategies was associated with an increased risk of restenosis risk.

MO-80 Arterial Healing after Fluoropolymer-Based Paclitaxel-Eluting Stent Implantation for Femoropopliteal Lesions: An Angioscopic Study

○Takuya Tsujimura, Osamu Iida, Shin Okamoto, Takayuki Ishihara, Kiyonori Nanto,
Yosuke Hata, Taku Toyoshima, Naoko Higashino, Sho Nakao, Toshiaki Mano
Kansai Rosai Hospital

[What's known?]

Fluoropolymer-based paclitaxel-eluting stent (Eluvia™, FP-DES) has currently shown the favorable clinical outcomes. However, its arterial healing has not been well elucidated to date.

[What's new?]

The current study was single center, retrospective observational study. We angioscopically compared 24 FP-DES in early phase (3 ± 1 months), 26 FP-DES in middle phase (12 ± 3 months), and 20 FP-DES in late phase (≥ 18 months) after FP-DES implantation. We assessed dominant neointimal coverage (NIC) grade and heterogeneity of NIC, and thrombus adhesion. NIC was graded as follows: grade 0, stent struts exposed; grade 1, struts bulged into the lumen, although covered; grade 2, struts embedded by the neointima, but translucent; grade 3, struts fully embedded and invisible. Heterogeneity was judged when the NIC grade variation ≥ 1 . Dominant NIC was significantly higher in middle phase ($P=0.021$) and late phase ($P<0.001$) than in early phase, whereas heterogeneity was significantly higher in middle phase (96.2%, $P=0.003$) and late phase (95.0%, $P<0.001$) than in early phase (70.8%). Furthermore, thrombus adhesion was observed in all stents among 3 groups. Arterial healing might not be sufficient even in late phase after FP-DES implantation for femoropopliteal lesions.

MO-81 Feasibility and impact of extra-vascular ultrasound-guided endovascular treatment for infrapopliteal artery occlusive disease

○Takahiro Tokuda, Yasuhiro Oba, Ai Kagase, Hiroaki Matsuda, Akira Murata, Yoriyasu Suzuki, Tatsuya Ito

Nagoya Heart Center

【What's known?】

This study aimed to examine the feasibility and impact of extravascular ultrasound (EVUS)-guided intervention for infrapopliteal (IP) artery occlusive disease.

【What's new?】

A retrospective analysis was performed using data collected from patients who underwent endovascular treatment (EVT) for IP artery occlusive disease between January 2018 and December 2020 at our institution. A total of 63 consecutive de novo occlusive lesions were compared according to the recanalization method utilized. Propensity score matching analysis was performed to compare the clinical outcomes of the methods utilized. Prognostic value was analyzed based on the technical success rate, distal puncture rate, radiation exposure, amount of contrast media, post-procedural skin perfusion pressure (SPP), and procedural complication rate. Consequently, EVUS-guided EVT for IP occlusive disease achieved a feasible technical success rate and significantly reduced radiation exposure.

MO-82 A case of central venous stenosis caused by chronic hemodialysis catheter

○Masaki Honda

Tokyo Bay Medical Center

【Case overview】

A 70-year-old woman on daily hemodialysis using chronic hemodialysis catheter was admitted to our hospital due to dialysis catheter dysfunction. No evidence of catheter kinking was shown in chest X-ray. Replacement of dialysis was performed. However, the catheter dysfunction was recurrence immediately. The venous angiography was performed to reveal the cause of catheter dysfunction.

【Procedure summary】

The venous angiography showed 99% stenosis of the superior vena cava (SVC). Balloon angioplasty (12.0x40mm MUSTANG) was done. However, acute recoil was observed, therefore, a self-expandable nitinol stent (14.0x60mm SMART) was implanted to stenosis of SVC. After stenting, the new dialysis catheter can be inserted smoothly.

【Clinical time course and implication (or perspective)】

After the venous stenting and catheter replacement, her clinical course was well. It is reported that 1) catheter placement from left side or via subclavian vein, 2) prolonged catheter placement, and 3) history of catheter-related bloodstream infection are the risk of the venous stenosis. Therefore for these target populations, imaging evaluation (like computed tomography) should be performed to detect the central vein stenosis before the catheter replacement.



MO-83 High-dose DCB with successful lesion preparation versus DES in patients with chronic total occlusion of the superficial femoral artery: a real-world single- center experience

○Masataka Arakawa, Naoki Hayakawa, Jyunji Kanda
Asahi General Hospital

【What's known?】

Several studies reported efficacy of DCB for complex FP lesion. However, few studies have compared high-dose DCB and DES in SFA CTO.

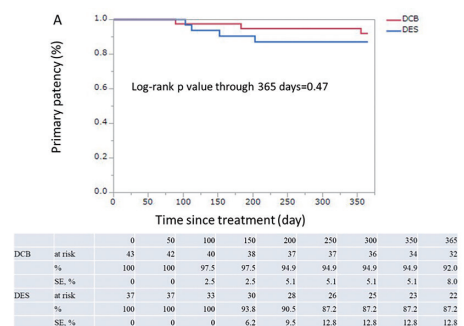
【What's new?】

The aim of this study was to compare the clinical outcome of high-dose DCB with DES in patients with SFA CTO.

Method: This was a single-center, retrospective study. From June 2018 to November 2020, we compared 43 cases treated with high-dose DCB and 37 cases treated with DES. The primary endpoint was 12-month primary patency. The secondary endpoints were 12-month freedom from CD-TLR, and 12-month freedom from re-occlusion.

Result: Baseline clinical data were comparable between the 2 groups. Mean lesion length and occlusion length were 21cm and 15cm in both groups. The subintimal angioplasty and the bailout stent rate was 0% in the DCB group. Kaplan-Meier estimated 12-month primary patency was 92.0% in DCB group, and 87.2% in DES group ($p=0.47$). Freedom from CD-TLR also did not differ significantly between the two groups (97.5% vs. 90.4%, $p=0.22$). The 12-month freedom from re-occlusion rate tended to be higher in the DCB group than in the DES group (97.5% vs 87.2%, $p=0.11$).

Conclusion: High-dose DCB with successful lesion preparation after the intraluminal approach showed 12-month clinical outcomes comparable to DES at SFA CTO.



MO-84 A case of recurrence of stent kinking after covered stent implantation for high-aortic occlusion with kissing stent technique

○Junya Arai, Tatsuya Nakama, Kotaro Obunai
Tokyo Bay Medical Center

【Case overview】

An 82-year-old female was admitted to our hospital due to rest pain on her right leg. She has a history of endovascular treatment for high-aortic occlusion with covered stent (VBX VIABHAN) using kissing stent technique. Furthermore, 1 month ago, she complained left leg rest pain due to left side VBX kinking. Therefore, she already received self-expand nitinol stent (E-Luminexx 14.0x60mm) implantation inside of the kinked VBX. CT-angiogram disclosed right-side VBX kinking and occlusion and patent left side stent.

【Procedure summary】

The angiography showed an kinking and occlusion of the right side VBX. A 7-Fr sheath was inserted into right femoral artery and 0.035-inch guidewire was crossed the occluded stent. After the pre-dilatation, E-Luminexx 14.0x60mm was implanted. Post-dilatation was performed with a non-compliant balloon (MUSTANG 10.0x40mm). Residual thrombotic stenosis was observed in the distal edge of VBX. Therefore, thrombus aspiration and additional self-expandable stent implantation (SMART 8.0x60mm) were performed. The final angiography showed successful revascularization.

【Clinical time course and implication (or perspective)】

After the procedure, her symptom improved, and no recurrence occurred.

MO-85 Pattern of Endovascular intervention for infrainguinal bypass grafts stenoses -Ten-Year Retrospective Single-Centre review in Australia

○Mei Ping Melody Koo, Hansraj Riteesh Bookun
St Vincent's Hospital Melbourne

【What's known?】

Background:Endovascular therapy (EVT) has been shown to improve graft patency in bypass grafts at-risk (BAR) in infrainguinal arterial bypasses (IIBs). This study aims to evaluate the efficacy of salvaging BARs in contemporary Australian vascular surgical practice.

【What's new?】

Methods:IIBs performed in a single centre from 2011 to 2020 were retrospectively reviewed. Demographics, operative details, and relevant associations were analysed by multivariate logistic regression. Primary study endpoints were graft patencies and limb salvage.

Results: Of the total 346 IIBs, 62 EVTs were performed for 45 grafts at-risk, most commonly indicated for anastomotic stenosis (>75%) on surveillance ultrasound. Plain balloon angioplasty was performed on 60 (97%) cases, 3 assisted with stents. The median graft age was 7 months. 11 (24%) grafts required repeated EVTs for restenoses. There were 2 losses to follow-up. At 2 years, the primary, assisted primary and secondary patency rates were 37%, 51% and 63%, respectively, with one major amputation.

Significant predictors for graft failure included prosthetic graft, re-do bypass and absence of run-off arteries ($p<.01$). Antiplatelet and anticoagulation therapies were not associated with improvement in graft patency.

Conclusions:Our study demonstrated the outcomes of EVTs on BARs in Australian practices. Interventions on prosthetic grafts and the use of medical therapies should be carefully considered in this patient cohort.

MO-86 Multidisciplinary treatment for ischemic wound at home

○Makoto Utsunomiya
TOWN Homecare Clinic

【What's known?】

Treatment for chronic limb threatening ischemia (CLTI) with ischemic wounds requires multidisciplinary collaboration such as rehabilitation, nutritional management, and orthotic devices as well as revascularization and wound treatment, and is often prolonged. We mainly treat CLTI patients at home in cooperation with the core hospitals. However, the clinical outcome of wound treatment at home is not clear. Therefore, we will clarify the treatment results of CLTI cases that our hospital mainly treated at home.

【What's new?】

A retrospective analysis was performed on CLTI patients with unhealed ischemic wounds treated at our clinic between May 2019 and December 2021.

During the study period, there were 149 patients with 175 limbs, an average age of 78.1 years, and 70 (47.0%) Rutherford classification Class 5 patients. The average observation period was 12.8 months, the ulcer healing rate was 38.3%, the lower limb amputation rate was 5.4%, and the mortality rate was 26.2%.

CLTI patients who are forced to be treated at home are in a worse group of patients, but their treatment outcomes are considered to be acceptable.

MO-87 Angiographic Improvement with Low-Density Lipoprotein Apheresis for No-option Chronic Limb-Threatening Ischemia due to below-the-ankle arterial lesions

○Shunsuke Kojima

Tokyo Bay Medical Center

【Case overview】

Chronic life-threatening ischemia (CLTI) is the most advanced form of peripheral artery disease (PAD) and has a poor prognosis. Despite the rapid development of interventional techniques and therapeutic choices, approximately 14–20% of CLTI patients have non-reconstructable peripheral vascular condition. Recently, a novel low-density lipoprotein apheresis (N-LDLA) using a mechanism of absorption type of blood purification device (Rheocarna™, Kaneka, Japan) has been approved for CLTI. However, little is known regarding the clinical effect of N-LDLA.

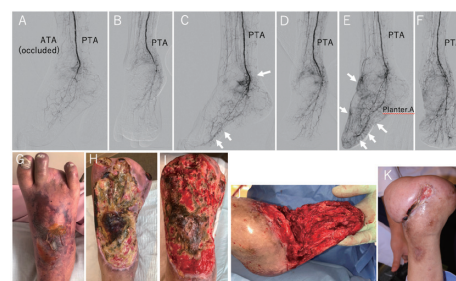
An 84-year-old male presented to our hospital with progressive right leg pain for two days. Digital subtraction angiography revealed total occlusion of anterior tibial artery (ATA) and diffuse stenosis of the posterior tibial artery (PTA).

【Procedure summary】

Although angioplasty of the ATA and PTA was performed, the digital gangrene developed. And N-LDLA was initiated.

【Clinical time course and implication (or perspective)】

After 10th session, the patient's pain subsided and newly formed capillary blood vessels (CVs) and wound brush (WB) were achieved. After completion of N-LDLA, the CVs and WB had further progressed. Our case shows that adjuvant LDL-apheresis can improve peripheral vascular beds in CLTI, which may improve the limb salvage and wound healing rate. To the best of our knowledge, this is the first report on angioscopic findings of CLTI treated with N-LDLA.



MO-88 Clinical Implications and timing of additional below-the-ankle angioplasty in chronic limb-threatening ischemia

○Shunsuke Kojima, Tatsuya Nakama, Kotaro Obunai

Tokyo Bay Medical Center

【What's known?】

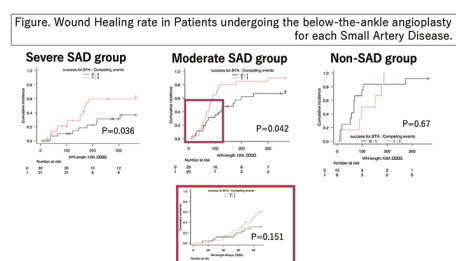
There are some reports regarding the prognostic factors of wound healing (WH) in chronic limb-threatening ischemia (CLTI) patients. However, the optimal timing of below-the-ankle (BTA) angioplasty for WH is still unclear. This study sought to assess the clinical implications and timing of BTA angioplasty for CLTI patients with small artery disease (SAD).

【What's new?】

Methods: This was a retrospective single-center study that consecutively enrolled 128 CLTI limbs with tissue loss (Rutherford 5/6) treated between January 2018 to October 2020. One-year WH after the initial endovascular treatment was compared, based on the degree of SAD; non-SAD, moderate SAD, and severe SAD.

Results: During the follow-up, 97 limbs (74.6%) achieved complete healing, and the WH rate for each SAD group was 94.7%, 78.7% and 67.2%, respectively. Regarding the BTA intervention, the WH rate was higher in moderate SAD (90% vs 73.1%, $p=0.036$) and severe SAD (74.2 vs 63.6%, $p=0.042$) in patients who underwent BTA intervention. In severe SAD group, the WH rate tends to be statistically different from earlier phase, however, not in moderate SAD group.

Conclusions: The current study revealed that additional BTA intervention might improve the WH rate for moderate and severe SAD. In moderate SAD, elective BTA angioplasty is enough for WH.



MO-89 Comparison of clinical outcomes between drug-coated balloon and drug-eluting stent in endovascular device therapy for femoro-popliteal chronic total occlusion lesions

○Atsuya Murai

Saiseikai Yokohama City Eastern Hospital

【What's known?】

Endovascular treatment (EVT) for femoro-popliteal chronic total occlusion (FP-CTO) lesions with drug-eluting stent (DES) or drug-coated balloon (DCB) showed favorable clinical outcomes in past studies, however there is no comparison of outcome of EVT for FP-CTO between DES and DCB.

【What's new?】

Between 2012 and 2021, this retrospective study enrolled 23 patients (26 limbs) treated with DCB and 37 patients (40 limbs) treated with DES. The endpoint was the incidence of primary patency and target region revascularization (TLR), all-cause mortality at 1 years. These endpoints were compared between DCB and DES group using Kaplan-Meier analysis. There was no significant difference in patient background, except for patients with chronic kidney diseases ($p = 0.01$). And there was no significant difference in lesion background (lesion length, $p = 0.17$ and severe calcification, $p = 0.79$). At the 1-year follow-up, there was not significantly difference in the rate of primary patency (73% vs. 82.5%, $p = 0.34$), TLR (3.8% vs. 2.5%, $p = 0.58$) and all-cause mortality (8.3% vs. 12.5% $p = 0.73$) between DCB and DES group. There was no significant difference in clinical outcomes between DCB and DES in EVT for de novo FP-CTO lesions.

MO-90 Patterns of rEstenosis after drug-CoAted balloon angioplasty (PECAN study)

○Naoko Higashino, Osamu Iida, Mitsutoshi Asai, Shin Okamoto, Takayuki Ishihara, Kiyonori Nanto, Takuya Tsujimura, Yosuke Hata, Taku Toyoshima, Sho Nakao, Toshiaki Mano

Kansai Rosai Hospital

【What's known?】

The angiographic patterns of restenosis post drug-coated balloon (DCB) angioplasty for femoropopliteal (FP) lesions and which treatment strategy would be more beneficial effect for the free from recurrent restenosis have not been fully investigated.

【What's new?】

This was a retrospective and multicenter study. This study included 95 patients (diabetes mellitus: 70%, hemodialysis: 56%) in 119 limbs (chronic limb-threatening ischemia: 55%, chronic total occlusion: 25%) with restenosis angiographically confirmed post FP-DCB angioplasty between January 2018 and December 2019. The angiographic patterns of restenosis was classified into 3 groups; class I: focal lesions ≤ 50 mm, class II: diffuse lesions > 50 mm, and class III: totally occluded lesions.

The mean follow up duration was 29.8 ± 9.5 months. Class I, II, and III accounted for 25.2%, 46.2%, and 29.0%, respectively. The 1-year rate of recurrent restenosis after revascularization was observed in 35.3%. The use of DCB was not significant different from the use of scaffolding, but significantly better patency was observed compared to the use of conventional balloon.

We evaluated the angiographic patterns of restenosis post FP-DCB angioplasty and the 1-year rate of recurrent restenosis after revascularization. Repeat DCB angioplasty was acceptable strategy with regards to 1-year recurrent restenosis.

MO-91

Role of Angioplasty with Drug-coated balloon for chronic ISchemia in wound Healing - Extended follow up -

○Yosuke Hata¹⁾, Osamu Iida¹⁾, Nobuhiro Ito²⁾, Yoshimitsu Soga²⁾, Masashi Fukunaga³⁾, Daizo Kawasaki³⁾, Masahiko Fujihara⁴⁾, Amane Kozuki⁵⁾, Mitsuyoshi Takahara^{6,7)}, Toshiaki Mano¹⁾

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[What's known?]

The slow flow phenomenon after application of drug-coated balloon (DCB) is occasionally experienced in clinical settings, supporting the speculated "downstream" distal embolization by crystalline paclitaxel and its carriers.

However, whether slow flow phenomenon after DCB have impact on wound healing in patients with chronic limb-threatening ischemia (CLTI) is unclear.

[What's new?]

This retrospective multi-center study enrolled 225 CLTI patients with ischemic wound who underwent endovascular therapy (EVT) for femoropopliteal lesions with DCB angioplasty. Slow flow phenomenon was evaluated by angiography and assigned a 0-2 Thrombolysis in Myocardial Infarction (TIMI) flow grade. Predictors for slow flow phenomenon were evaluated by Logistic regression analysis. The association between slow flow phenomenon as well as baseline characteristics and wound healing was also analyzed Cox regression hazard models. Slow flow phenomenon after DCB angioplasty was observed in 36 patients (16%). After multivariate analysis, long lesions and poor BTA run-off were independent predictor of slow flow phenomenon. Additionally, non-ambulatory status and poor BTA run-off were significantly associated with wound healing after DCB angioplasty, while slow flow phenomenon was not.

MO-92

Impact of cilostazol administration on prevention for aspiration pneumonia in patients with chronic limb-threatening ischemia

○Yosuke Hata¹⁾, Osamu Iida¹⁾, Shin Okamoto¹⁾, Takayuki Ishihara¹⁾, Kiyonori Nanto¹⁾, Takuya Tsujimura¹⁾, Taku Toyoshima¹⁾, Naoko Higashino¹⁾, Sho Nakao¹⁾, Toshiaki Mano¹⁾, Eisaku Ito²⁾, Takao Ohki²⁾

¹⁾Kansai Rosai Hospital,

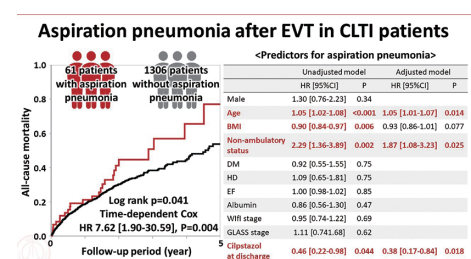
²⁾Division of Vascular Surgery, Department of Surgery, The Jikei University School of Medicine

[What's known?]

Cilostazol has multiracial effects in patients with peripheral artery disease (PAD), representatively improving walking distance and reducing the rate of restenosis after endovascular therapy (EVT). On the other hand, several reports from the field of cerebrovascular disease that cilostazol reduced a risk of aspiration pneumonia after ischemic stroke. Common cause of death in patients with chronic limb-threatening ischemia (CLTI), which is the most severe manifestation of PAD, is pneumonia. However, whether cilostazol reduced a development risk of aspiration pneumonia in CLTI is unclear.

[What's new?]

This retrospective single-center study enrolled 1367 CLTI patients primarily treated with EVT between April 2010 and December 2019. The diagnosis of aspiration pneumonia was determined by registered disease name in medical records. Predictors for development of aspiration pneumonia were evaluated by logistic regression analysis. The association between aspiration pneumonia and all-cause mortality were also analyzed Kaplan-Meier method and time-dependent Cox models. After multivariate analysis, predictors for development of aspiration pneumonia were age (hazard ratio (HR) 1.05 [95% confidential interval 1.01-1.07], per one year increase), non-ambulatory status (HR 1.87 [1.08-3.23]), and cilostazol (HR 0.38 [0.17-0.84]). All-cause mortality were significantly higher in patients with aspiration pneumonia than those without (log rank P=0.041, HR 7.62 [1.90-30.59] in time-dependent Cox models).



MO-93 Successful total percutaneous endovascular stent-graft treatment of a ruptured abdominal aortic aneurysm with an aorto-caval fistula

○Yuta Azumi, Ryota Hara, Tatsuya Nakama, Shinsuke Kotani
Tokyo Bay Medical Center

【Case overview】

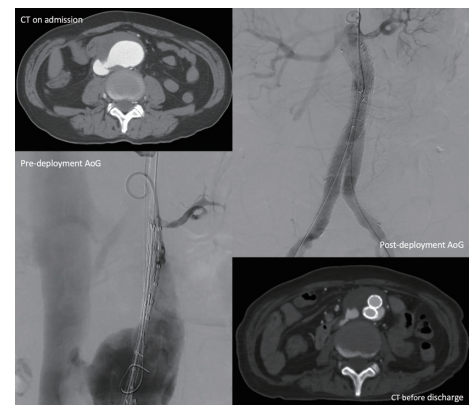
A 71-year-old male presented to the emergency department with acute abdominal back pain, dyspnea and shock vitals. Computed tomographic angiography (CTA) demonstrated a 65-mm ruptured abdominal aortic aneurysm (RAAA) with an aorto-caval fistula (ACF), a communication between the aneurysm and the inferior vena cava (IVC). An emergent endovascular approach was needed to stabilize the haemodynamics. Using the preclose technique of femoral artery access, percutaneous endovascular aortic repair (PEVAR) was performed immediately, and the patient had an unexpected recovery.

【Procedure summary】

At first, an intra-aortic balloon occlusion system via left brachial artery access was introduced. After the double Perclose ProGlide (Abbott, USA) preclose of bilateral common femoral arteries, an EXCLUDER bifurcated stent-graft (Gore, USA) and an additional EXCLUDER left common iliac leg were deployed below the origin of the bilateral renal arteries, which covered the ACF, ruptured aortic segment. Regardless of persistent type 2 endoleak from lumbar arteries, the haemodynamics became stable.

【Clinical time course and implication (or perspective)】

Several times CTA showed no extra blood flow to retroperitoneal or intraperitoneal space, but communication between the type 2 endoleak and the IVC, and aneurysm size reduction. He suffered from paralytic ileus, but was finally discharged 38 days later. PEVAR is feasible option for ACFs, uncommon severe complications with RAAAs.



MO-94 Single-center Contemporary Clinical Outcomes after Endovascular Treatment in Patients with De novo Femoropopliteal Lesions between 2017 and 2019

○Daiki Kumazawa, Kazunori Horie, Akiko Tanaka, Norio Tada
Sendai Kousei Hospital

【What's known?】

In our country, DCB and DES have been available for treating femoropopliteal disease since 2017 and 2019. But there is sparse data of the impact of DCB and DES on clinical outcomes in daily practice.

【What's new?】

We retrospectively analyzed consecutive 407 patients with de novo femoropopliteal lesions and were undergoing EVT in our hospital between 2017 and 2019. We compared baseline background and one-year clinical outcomes between 2017 (n = 93), 2018 (n = 128), and 2019 (n = 186). The one-year primary patency increased significantly, whereas the one-year amputation-free survival was similar between each era. Cox proportional hazard multivariate analysis revealed that restenosis was independently associated with advanced age (p = 0.033) and hemodialysis (p < 0.001). Conversely, Using paclitaxel-based devices (p < 0.001) and larger diameter of the finalized devices (p = 0.008) were protective factors against restenosis. In conclusion, this study confirmed that the primary patency rate at one year after EVT in femoropopliteal lesions was improved by effective utilization of paclitaxel-based devices.

MO-95 High pressure balloon and scoring balloon as a vessel preparation for drug coated balloon

○Masami Shingaki

Hakodate Municipal Hospital

【What's known?】

There are not yet the consensus about the high pressure balloon (HP) as a vessel preparation for drug coated balloon (DCB).

【What's new?】

From May 2018 to April 2021, 156 cases of DCB were included. 70.5% (110 cases) were male. Age was 74.2 ± 10.1 y/o, 58.3% (91 cases) of diabetes mellitus and 39.1% (54 cases) of Hemodialysis. In lesion background, CTO and CLTI were 35.3% (55 cases) and 29.5% (46 cases), respectively, and the lesion length was 101.4 ± 78.9 mm. There was no significant difference in primary patency at 1 year between low and high dose DCB (79.9% vs 76.9%; $p=0.422$). In CTO and long lesion length (≥ 200 mm) we could also showed no significant difference in 1-year primary patency between low and high dose DCB ($p=0.239$, $p=0.455$). As a vessel preparation, standard PTA was 81 cases, 52 cases of HP and 34 cases of scoring balloon (HP and scoring was overlapped). The 1-year patency rates were 73.5% for standard PTA, 77.4 % of HP and 92.7% of scoring balloon. There were no significant difference ($p=0.182$) but we could get the tendency of higher patency rate in scoring balloon.

MO-96 Procedural outcome of renal foot in patients with end-stage renal disease and chronic limb-threatening ischemia after endovascular therapy

○Tomoya Fukagawa, Shinsuke Mori, Shigemitsu Shirai, Masafumi Mizusawa, Toshiki Tishiki, Mana Hiraishi, Kenji Makino, Yohsuke Honda, Masakazu Tsutsumi, Norihiro Kobayashi, Masahiro Yamawaki, Yoshiaki Ito

Saiseikai Yokohama-city Eastern Hospital

【What's known?】

The current study reported that the end-stage renal disease (ESRD) patients frequently exhibit the arterial disease pattern of the “renal foot”. However, The outcome of “renal foot” was unclear.

【What's new?】

The aim of this study was to investigate the procedural outcome of “renal foot” in patients with ESRD and chronic limb-threatening ischemia (CLTI) after endovascular therapy (EVT). We enrolled a total of 133 consecutive CLTI patients (169 limbs) who underwent EVT between February 2008 and December 2017. we divided into two groups according to the renal foot or not. The “renal foot” was defined as a specific angiographic pattern of lower extremity arterial disease that demonstrated the concurrent significant stenosis in both the posterior tibial artery and lateral plantar artery. In renal foot group, the rate of direct blood flow to wound was significantly lower than non renal foot group (39% vs. 73%, $P<0.01$)

MO-97 Present and future of atherectomy devices for the treatment of patients with peripheral arterial disease in femoropopliteal lesions ~Japanese regulatory view~

○Chiaki Kiyokawa

Pharmaceuticals and Medical Devices Agency

【What's known?】

Drug-coated balloon (DCB) is first-line treatment option for patients with symptomatic occlusive atherosclerotic lesions in the superficial femoral and popliteal arteries. Most of these patients have severe calcified lesions, which is one of the risk factors of vessel recoil, due to diabetes and dialysis. Therefore, restenosis frequently occurs in these patients after DCB treatment.

【What's new?】

Atherectomy device to remove severe calcified lesions before DCB treatment got approved in Japan last year. Removing calcified lesions with atherectomy device is expected to play an important role in completing DCB treatment for severe calcification. However, the indication for use of atherectomy device in Japan is limited compared to that of foreign countries.

At this presentation, we would like to introduce how we reviewed of the atherectomy device based on PMDA review report and the result of clinical trial conducted in Japan. Besides, we believe that this presentation will provide a great opportunity for the stakeholders to consider future direction of this device's continuous development including taking and utilizing Real world evidence in anticipation of expanded indication.

MO-98 Incidence and predictors of peripheral acute thrombotic events in patient presenting femoropopliteal lesions treated by anti-restenotic devices

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【What's known?】

Cohesive reports on the incidence of acute thrombotic occlusion (ATO) after EVT using contemporary FP devices are scarce.

【What's new?】

Methods: We retrospectively examined 866 lesions (chronic limb-threatening ischemia: 43%, TASC II C/D lesion: 72%, involving popliteal arterial lesion: 65%) in 617 patients (mean age: 75 ± 9 years, male: 70%, hemodialysis: 33%) who successfully underwent EVT with contemporary FP devices (drug-coated stent: n=222, stent-graft: n=172, drug-eluting stent: n=162, interwoven stent: n=44, drug-coated balloon [DCB]: n=266) from June 2012 to July 2020. The outcome measure was ATO defined as the following criteria: 1) rapid symptom occurrence, 2) thrombus present during the procedure, and 3) lesion resolution by thrombolysis therapy. Cox proportional hazards regression models were used to identify the predictors of ATO.

Results: The 24-month incidence of ATO in the overall population was 4.8 ± 0.8% (DCB: 0.9 ± 0.6% versus stents: 6.3 ± 1.1%, P<.01). Hemodialysis (hazard ratio [HR]: 3.63, P<.01) and involving popliteal lesion (HR: 3.79, P<.01) were independently associated with the incidence of ATO in patients treated with stents.

Conclusion: We found a substantial incidence of ATO after contemporary FP-EVT, particularly with stents. Hemodialysis and involving popliteal lesion were significantly associated with ATO in patients treated with stents.

MO-99 **Techniques and outcomes of endovascular treatment for celiac vascular disease**

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【What's known?】

Objective: Endovascular treatments (EVT) are commonly applied to celiac aneurysm and dissection. However, there is no consensus about optimal treatment techniques due to the various anatomical and pathological conditions. The purpose of this study was to verify feasibility and safety of EVT for the celiac vascular disease.

Materials and Methods: This retrospective study included 8 patients who underwent EVT for celiac vascular disease (celiac aneurysm 2, dissection 6; Emergency 2, waiting 6). All dissection cases showed increase of the false lumen.

【What's new?】

Results: All cases were successfully treated. Embolization was performed in 6, and stent-graft was placed in 2. The organ infarction was not seen. The main collateral supplies to the liver were the gastroduodenal artery in 5, the peribiliary vascular plexus in 2, and the inferior phrenic artery in 1. During the follow-up period, recanalization was not observed.

Conclusion: EVT for the celiac aneurysm and dissection was feasible although various techniques were applied. The organ infarction could be avoided due to the development of the collateral arteries after embolization.

MO-100 **Factors associated with early and late restenosis following Drug-Coated Balloon treatment for patients in femoropopliteal lesions**

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【What's known?】

Introduction: Drug-coated balloon (DCB) improves clinical outcomes for the treatment of femoropopliteal (FP) lesions. However, factors associated with early (within 6-month) and late restenosis (after 6-month) following DCB treatment for FP lesions have not been well elucidated.

【What's new?】

Methods: This was a multicenter and retrospective study enrolling 486 lesions in 423 patients who underwent endovascular therapy using DCB between January 2018 and December 2019. The predictors of early and late restenosis were evaluated by multivariate analysis.

Results: The average observation period was 25.3 ± 12.1 months. A total of 31 lesions and 138 lesions developed early and late restenosis, respectively. Multivariate analysis revealed that chronic total occlusion (Hazard ratio [HR]: 2.29, $p=0.033$) and involving superficial femoral artery (SFA) ostial lesion (HR: 2.73, $p=0.009$) were significantly associated with early restenosis, while calcification angle over 270° (HR: 1.68, $p=0.004$), distal external elastic membrane (EEM) diameter on IVUS (HR: 0.97, $p<0.001$) and involving popliteal arterial lesions (HR: 1.50, $p=0.023$) were significantly associated with late restenosis.

Conclusion: The factors associated with early restenosis following DCB treatment in femoropopliteal lesions may differ from those with the late ones.