

## MO-1 Isolated below-the-knee stenosis/ occlusion is a risk factor of wound healing in patients with chronic limb-threatening ischemia

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【What's known?】

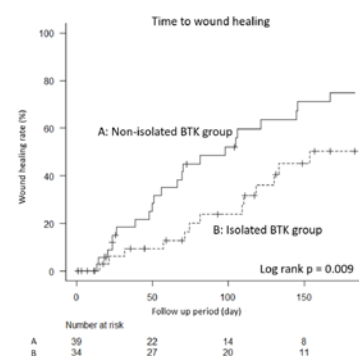
**Introduction:** Isolated below-the-knee (BTK) artery lesion (stenosis or occlusion) is known as a predictor of delayed wound healing after endovascular treatment (EVT) in patients with chronic limb-threatening ischemia (CLTI). However, there are limited reports on this in Japan.

【What's new?】

**Method:** A total of 73 limbs in 58 patients with CLTI who underwent EVT between April 2020 and May 2023 in our hospital were retrospectively analyzed. The primary endpoint was wound healing within 6 months after initial EVT. Wound healing with minor amputation was regarded as achievement of primary endpoint. We divided study limbs into isolated BTK and non-isolated BTK groups and compared the incidence of primary endpoint between the groups using Cox proportional hazard model and the Kaplan-Meier method.

**Result:** Non-isolated BTK group and isolated BTK group included 39 and 34 limbs, respectively. The overall rate of wound healing was 64.4%. The incidence of wound healing in isolated BTK group was significantly lower by Kaplan-Meier curves (73.8% versus 49.5%, log rank  $p=0.009$ ). Cox proportional hazard multivariate analysis revealed time to wound healing was independently associated with isolated BTK lesion. (HR: 0.49;95% CI: 0.26-0.91;  $p=0.024$ )

**Conclusion:** Isolated BTK lesion was identified as a risk factor of delayed wound healing in patients with CLTI.



## MO-2 Impact of postprocedural minimum lumen area on clinical outcome after femoropopliteal drug-eluting stent implantation

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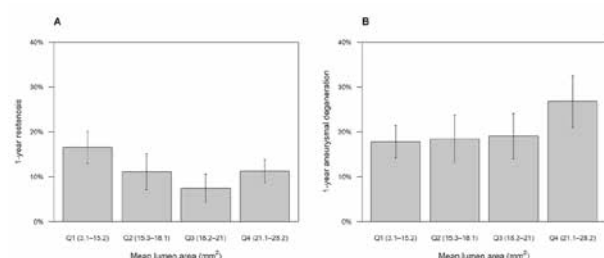
<sup>3</sup>Osaka Police Hospital, <sup>4</sup>Kokura Memorial Hospital, <sup>5</sup>Matsuyama Red Cross Hospital

【What's known?】

Although favorable results of fluoropolymer-based drug-eluting stent (FP-DES) treatment for femoropopliteal lesions have been reported, it is unclear whether minimal lumen area (MLA) after FP-DES implantation affects clinical outcomes.

【What's new?】

This study aimed to reveal the association between intravascular ultrasound (IVUS)-evaluated MLA and the 1-year risk of restenosis and aneurysmal degeneration after FP-DES implantation for femoropopliteal lesions in 718 limbs of 686 patients from a subanalysis of the CAPSICUM (Contemporary outcomes After Paclitaxel-eluting peripheral Stent implantation for symptomatic lower limb ischemia with superficial femoral or proximal popliteal lesion) study. The 1-year incidence rate of restenosis was estimated to be 8.8% (95% CI, 6.1% to 12.5%) for the upper quartile of MLA (21.1 mm<sup>2</sup>) versus 14.3% (95% CI, 10.7% to 18.7%) for the lower quartile of MLA (15.2 mm<sup>2</sup>), with an odds ratio of 0.58 (95% CI, 0.36 to 0.93), whereas the 1-year incidence rate of aneurysmal degeneration was 23.8% (95% CI, 19.5% to 28.8%) for the upper quartile versus 16.8% (95% CI, 12.6% to 22.0%) for the lower quartile, with an odds ratio of 1.55 (95% CI, 1.04 to 2.32). A large MLA after FP-DES implantation for femoropopliteal lesions was associated with decreased restenosis risk but increased aneurysmal degeneration risk.



### **MO-3 The outcomes of combination therapy using both DES and DCB for SFA CTO**

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#### **【What's known?】**

Background: Over the past five years since the introduction of Drug-Coated balloon (DCB) for F-P lesions, they have become the first choice as the final device.

#### **【What's new?】**

However, DCB have weaknesses, with SFA ostial lesions being a significant predictor of loss of patency, often involving thrombotic plaque. In this cases, we often use Drug Eluting Stent (DES). The current recommendation is full coverage with DES, but Total stent length becomes longer. Therefore, in our hospital, we have been performing combination therapy by deploying DES only in the proximal segment and utilizing DCB in the distal segment.

Method: We retrospectively analyzed 45 cases of combination therapy (proximal DES, distal DCB) for SFA ostial CTO performed at our institution from February 2019 to February 2023, assessing freedom from CD-TLR at one year.

Result: Eluvia stent was used in 95% of cases, Zilver PTX in 5%. The DCBs used were IN PACT (51%), LUTONIX (22%), and Ranger (27%). The one-year CD-TLR rate was 86.7%. Additional statistical considerations are reported.

### **MO-4 Clinical outcome between low-dose and high-dose drug-coated balloon angioplasty for femoropopliteal artery chronic total occlusion lesions**

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

#### **【What's known?】**

Previous clinical reports of femoropopliteal chronic total occlusion (CTO) lesions showed feasible results for drug-coated balloon (DCB). However, clinical outcomes between low-dose (LD) and high-dose (HD) DCB in the CTO lesions has not been well studied.

#### **【What's new?】**

This study was conducted as a single-center, retrospective cohort study. We enrolled 63 patients undergoing initial endovascular therapy with DCB between June 2018 and February 2023. Of the 63 patients, 24 were in LD and 39 were in HD. These lesions did not underwent bailout stenting, and all CTO lesions were performed intra-luminal wiring confirmed by intravascular ultrasound. The primary outcome was 1-year primary patency and secondary outcome was freedom from target lesion revascularization (TLR).

The lesion length ( $199.7 \pm 71.4$  vs.  $191.8 \pm 92.1$ ,  $p=0.72$ ), PACCS grade 4 lesions (20.8% vs. 23.1%,  $p=0.83$ ), and chronic limb-threatening ischemia (37.5% vs. 28.2%,  $p=0.44$ ) were not significantly difference between the group. The primary patency was slightly higher in HD group, but there was no significant difference (76.0% vs. 85.3%, log-rank  $p=0.53$ ). Freedom from TLR was not significantly different between the groups (95.0% vs. 94.2%, log-rank  $p=0.98$ ).

The current study showed that 1-year primary patency and freedom from TLR were not significantly different between LD-DCB and HD-DCB groups.

## MO-5 The impact of stepwise balloon angioplasty for de novo femoropopliteal artery disease

○Takahiro Tokuda  
Nagoya Heart Center

### 【What's known?】

There are a lot of ballooning methods and its importance was proved because of published data. However, we did not know the details of the impact of stepwise balloon angioplasty. This study aimed to examine the impact of stepwise balloon angioplasty for de novo femoropopliteal (FP) artery disease.

### 【What's new?】

A retrospective analysis was performed using data collected from patients who underwent endovascular treatment (EVT) for FP disease between August 2018 and December 2019 at three institutions. During the period, we performed EVT for 310 FP lesions. Of these lesions, a total of 238 FP lesions were analyzed and propensity score matching analysis was performed to compare stepwise balloon angioplasty and conventional balloon angioplasty. The prognostic value was analyzed based on angiographic dissection pattern, the rate of bailout stent, procedural complications, and the rate of target lesion revascularization (TLR) within 1 year. 57 matched pairs of patients were analyzed after propensity score-matched analysis. Severe vessel dissection pattern defined as type C or higher was significantly observed in the conventional balloon angioplasty. (28.1% vs 12.3%,  $p=0.03$ ) There were no significant differences between the two groups in the rate of bailout stent, procedural complications, and the rate of TLR.

## MO-6 Impact of Medial Arterial Calcification on Wound Healing in Patients with Chronic Limb-threatening Ischemia

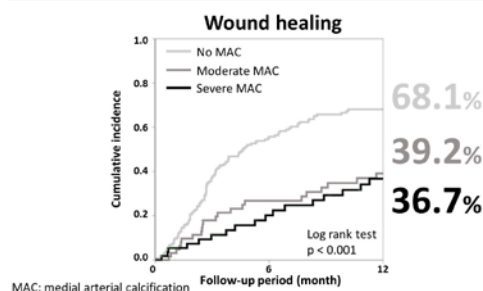
○Yosuke Hata, Takayuki Ishihara, Mitsutoshi Asai, Shin Okamoto, Kiyonori Nanto, Takuya Tsujimura, Naoko Higashino, Sho Nakao, Masaya Kusuda, Toshiaki Mano  
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### 【What's known?】

While the medial arterial calcification (MAC) score is associated with major adverse limb events defined as major amputation and reinterventions in patients with chronic limb-threatening ischemia (CLTI), its impact on wound healing has not been elucidated.

### 【What's new?】

This study was a single center retrospective study, including the consecutive 365 patients with CLTI accompanied by ischemic wound undergoing inframalleolar angioplasty between April 2010 and December 2020. The MAC score was determined as the sum of the presence of MAC at five vascular sites in the foot: (1) dorsal pedis; (2) lateral planter; (3) the first metatarsal; (4) the first toe; and (5) other toe arteries. Then, the MAC score was classified into three groups: no MAC (total score 0-1); moderate MAC (total score 2-3); and severe MAC (total score 4-5). One-year cumulative incidences of wound healing were 68.1%, 39.2%, and 36.7% in patients with no, moderate, and severe MAC scores, respectively (log-rank  $p < 0.001$ ). In multivariate analysis, serum albumin  $< 3.0\text{g/dL}$  (hazard ratio [HR] 0.58, 95% confidence interval [CI] 0.40-0.86,  $p=0.006$ ) and MAC score (HR 0.68, 95% CI 0.52-0.88,  $p=0.004$ , per 1-grade increase) were detected as independent predictors of wound healing.



## MO-7 DCB for BTK arteries in CLTI patients

○Lianrui Guo

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### 【What's known?】

RCTs have not given consistent conclusion on whether DCB can achieve a better efficacy and safety in BTK artery lesions, including CLTI patients, while these controversies also lack of validation in the real world.

### 【What's new?】

From December 2020 to February 2023, we prospectively collected patient data in ten Chinese hospitals to achieve the largest sample size real-world study to analyze the results of DCB angioplasty in BTK lesions for CLTI patients. Previously, we published partial data showing acceptable 6-month results. Now, we have enrolled more patients and completed 1 year of follow-up. Here we will present our latest satisfactory results, including freedom from major adverse events, amputation-free survival, freedom from major amputation, overall survival, and freedom from CD-TLR.

## MO-8 Intracranial atherosclerotic disease management: Setting a novel path

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Neurosurgery resident 3rd year, LTMMC Sion , Mumbai

### 【What's known?】

#### Introduction

Intracranial atherosclerosis disease (ICAD) is one of the leading causes of ischemic stroke. Despite the superiority of aggressive medical management according to SAMMPRIS trial, 15% of patients in the medical arm still had a primary end point during a median follow-up of 32.4 months. In all our ICAD cases, we did angioplasty and stent deployment by novel method called "First Balloon Then Stent" (FBTS).

#### Methods & Materials

Patients were selected according to predefined inclusion and exclusion criteria. Neurospeed PTA (percutaneous Transluminal angioplasty) balloon microcatheter and Credo stent were used in all cases for angioplasty and stent insertion. Before discharge, all patients underwent a clinical examination. Follow up clinical examination was done after 3 months and those who cannot be followed up were called and asked for any symptoms of stroke within 3 months.

### 【What's new?】

#### Results

Total 22 patients (15 males and 7 females) were studied with mean age 53.11 years. None of the patients had developed further stroke or TIA (Transient ischemic attacks) on clinical or telephonic follow up.

#### Conclusion

Our data showed that FBTS method can be considered as viable option for patients who experiences multiple stroke or transient ischemic attacks in spite of aggressive medical management.



Fig 1 Before angioplasty

Microwire negotiation

## MO-9 Usefulness of evaluating calcification after adjustment of halation using non-contrast CT for the below the knee lesion

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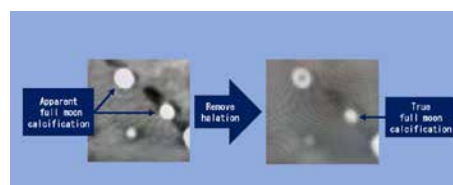
<sup>1)</sup>Juntendo University Urayasu Hospital, <sup>2)</sup>Juntendo University Hospital

### 【What's known?】

When evaluating severe calcified plaque with CT, these plaques often look like full moon by halation especially in BTK lesions, which we named “apparent full moon calcification”. Although “apparent full moon calcification” was considered as an obstacle in EVT, it remains unexamined.

### 【What's new?】

By adjusting window level and window width of images to remove halation, calcification can be divided into apparent or true full moon calcification (Figure). We enrolled 103 vessels including 37 CTO lesions in 80 patients receiving EVT for BTK lesions. The correlation between antegrade wire success and the ratios of slices including apparent or true full moon calcification to slices in target vessels and lesions were examined. Unsuccessful antegrade wire crossing accounted for 28.2% (n=29). The ratio of apparent full moon calcification did not differ between the wire unsuccessful and successful groups (42.4 vs. 32.9% in target vessel, p=0.206, 42.8 vs. 32.4% in target lesion, p=0.182). Whereas the ratio of true full moon calcification was significantly higher in the wire unsuccessful group (21.0 vs. 9.5% in target vessel, p<0.05, 23.1 vs. 7.7% in target lesion, p<0.05). In conclusion, severe calcification in BTK lesions evaluated without halation is a useful predictor of unsuccessful wire crossing.



## MO-10 Clinical impact of Cilostazol administration after endovascular treatment with two different drug coated balloons, sub-study of BEASTAS registry

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<sup>1)</sup>Shonan Kamakura General Hospital, <sup>2)</sup>Osaka University Graduate School of Medicine,

<sup>3)</sup>Tokyobay Urayasu Ichikawa Medical Center, <sup>4)</sup>Funabashi Municipal Medical Center,

<sup>5)</sup>Tokyo Saiseikai Central Hospital

### 【What's known?】

Cilostazol is an anti-proliferative drug that has been effective after endovascular treatment. However, the impact of Cilostazol on the clinical outcome after drug coated balloons (DCBs) has been scarcely investigated and might differ between two commercially available balloons. Therefore, this study sought to assess the disparity in the impact of Cilostazol on patency after endovascular treatment with DCBs.

### 【What's new?】

Out of the entire cohort of the BEASTARS registry (n=3635), 1367 patients received a single type of DCB for the femoropopliteal lesions. Of those, 484 received low-dose DCB, and 883 received high-dose DCB. The whole analysis did not reveal the effectiveness of Cilostazol for primary patency at three years (Log-rank, p=0.137). When dividing the study cohort based on the type of DCB, the impact of Cilostazol was insignificant in both types. However, the Kaplan-Meier curve showed similar curves in the high-dose DCB group (Log-rank, p=0.206; Wilcoxon, p=0.371), while the curve in the low-dose group revealed the difference in the early period (Log-rank, p=0.102; Wilcoxon, p=0.050).

The impact of Cilostazol may vary according to the type of DCB: Cilostazol prescription may be effective and required for better patency after EVT with low-dose DCB.

## MO-11 Evaluation of the validity of anatomical merkmal method for anterolateral popliteal puncture technique

○Daisuke Yamazaki

Akita Cerebrospinal and Cardiovascular Center

### 【What's known?】

Anterolateral popliteal puncture technique was reported in 2017 and has many advantages. We investigated the anatomical merkmal of anterolateral popliteal artery puncture and verified the efficacy of the merkmal method by contrast-enhanced lower limb CT.

### 【What's new?】

**Method:** We assumed the popliteal artery would tun along the medial margin of the fiblar head when the medial mergin of the fiblar head and the tibia were in the most separated oblique position. On bone 3D CT images, we set a region of interest(ROI) over the expected course of the popliteal artery according to the merkmal method. The primary end point was a hit rate, difined as the ratio of the area of popliteal artery in the ROI on 3D CT divided by the area of the popliteal artery at the same level on contrast-enhanced CT.

**Result:** We retrospectively validated the merkmal method in 56 patients who underwent contrast-enhanced CT at our hospital. the hit rate was 66.5%(range, 39.8%-87%).

**Conclusion:** This finding indicates the potential of the merkmal method to facilitate anterolateral popliteal puncture.



## MO-12 Integrated Multi-Omics Analysis of Prognostic Biomarkers and Therapeutic Targets of Aortic Dissection

○Yufei Zhao, Weiguo Fu, Lixin Wang

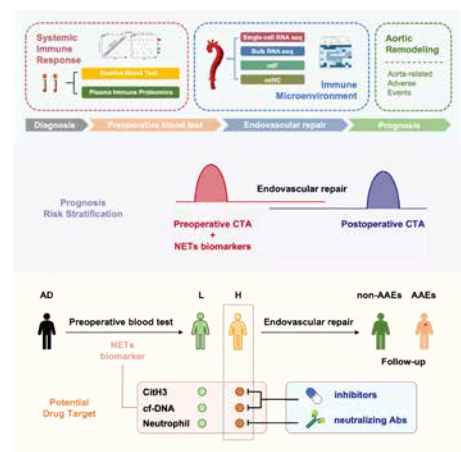
Zhongshan Hospital Fudan University

### 【What's known?】

Adverse aortic remodeling increases the risk of aorta-related adverse events (AAEs) after thoracic endovascular aortic repair (TEVAR) and affects the overall prognosis of aortic dissection (AD). It is imperative to delve into the exploration of prognostic indicators to streamline the identification of individuals at elevated risk for postoperative AAEs, and therapeutic targets to optimize the efficacy of TEVAR for patients with AD.

### 【What's new?】

Integrated multi-omics profiling identified highly phenotype-associated macrophages, which frequently interacted with neutrophils via CXCL3/CXCR2 axis, and promoted neutrophil extracellular traps (NETs) in driving and fueling the development of AD. Increased NETs formation is a defining feature of systemic immunity and aortic microenvironment of AD. Furthermore, we demonstrated that the level of citrullinated histone H3 (CitH3), a NETs associated marker, could serve as a risk factor for AAEs following endovascular therapy. Inhibiting NETs formation through the blockade of CitH3 alleviated the progression and rupture of AD in mice.



## MO-13 Outcomes of covered stents versus bare-metal stents for subclavian artery occlusive disease

○Xixiang Gao

Xuanwu Hospital Capital Medical University

### 【What's known?】

Many studies on in-stent restenosis of the subclavian artery analyzed the corresponding risk factors, including smoking, diabetes, homocysteine concentration, stent length, blood lipid level, postoperative antiplatelet therapy, and others. However, there are few reports about the effect of the stent type (covered or bare) on in-stent restenosis.

### 【What's new?】

The aim of this study (n=161) was to compare the clinical efficacy of covered stents and bare-metal stents in the endovascular treatment of subclavian artery occlusive disease. Consequently, compared with bare stents, covered stents have a higher midterm primary patency in the treatment of subclavian artery occlusive disease.

## MO-14 Flow-diverter stent placement for unruptured right communicating segment ICA aneurysm presenting as bitemporal hemianopsia: A Systematic Review and Illustrative Case

○John Emmanuel R Torio, Jay B Villavicencio

UERM Hospital

### 【What's known?】

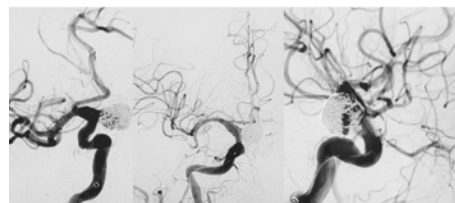
Vast majority of unruptured intracranial aneurysms (UIA) do not show symptoms, with only around 10% becoming apparent before rupture, typically displaying signs of compression effects secondary to large or rapidly growing aneurysms which leads to urgent treatment.

### 【What's new?】

We report a case of 59-year-old male with an unruptured right communicating segment ICA aneurysm presenting as bitemporal hemianopsia who was treated with flow-diverter stent and partial coil embolization. We also performed a systematic review of patients with ICA aneurysms presenting with neuro-ophthalmologic symptoms treated with flow diverter stents and discussed the clinical features and outcomes.

Use of flow-diverter devices offers a safe and effective strategy for treatment of patients presenting with visual dysfunction secondary to compression of unruptured intracranial aneurysm. Best treatment option must include not only the aneurysm occlusion but also relief of the mass effect. Early detection and treatment of compression symptoms increases the likelihood of symptom improvement hence prioritization of this treatment over other modalities is crucial, especially in a setting such as in the Philippines wherein limited facilities are capable of these endovascular interventions.

### ANGIOGRAPHIC CONTROL RUNS



## MO-15 Go Through the Rashomon of Renal Artery Practice: Open Surgery or Endovascular Intervention?

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### 【What's known?】

Renal artery aneurysm (RAA) is a rare disease. This study proposed and evaluated a new classification for renal artery aneurysm (RAA) to assist in surgical decision-making.

### 【What's new?】

A evaluated new classification for renal artery aneurysm (RAA) to assist in surgical decision-making will be presented, which based on 105 patients with RAAs achieved kappa level of 0.752 compared to a level of 0.579 from the classic Rundback classification. The classification assigned endovascular repair as first-line treatment (for type I or II), while open techniques were conducted if anatomically suitable (for type III). Technical primary success was achieved in 100% and 96.05%, symptoms were completely resolved in 100% and 84.85%, while hypertension was relieved in 84.21% and 72.92% of patients receiving open surgery or endovascular repair, respectively. No significant difference was observed for peri-operative or long-term complications among the 3 classification types. Typical cases will be shown in the slides to illustrate different surgical path for different subtypes.

## MO-16 Prognostic impact of C-reactive protein level in patients with lower extremity arterial disease undergoing endovascular treatment

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<sup>1</sup>Shinshu University School of Medicine, <sup>2</sup>Nagano Municipal Hospital,

<sup>3</sup>Shinonoi General Hospital, <sup>4</sup>Nagano Red-cross Hospital, <sup>5</sup>Iida Hospital

### 【What's known?】

Inflammation plays a key role for the development of atherosclerotic diseases and is a relevant predictor for cardiovascular outcomes. The prognostic value of serum C-reactive protein (CRP) remains unclear among patients with lower extremity arterial disease (LEAD).

### 【What's new?】

Patients with LEAD were prospectively included, and 240 patients with intermittent claudication were analyzed. The primary endpoint was major adverse event (MAE) defined as composite of all-cause death, non-fatal myocardial infarction, stroke and major amputation at 5 years. Patients were divided into 2 groups according to the CRP level at baseline (low CRP:  $\leq 0.14$  mg/dl, high CRP:  $> 0.14$  mg/dl).

A total of 96 patients (43.8%) had an increased CRP level at baseline. The high CRP group had a higher prevalence of hypertension, hemodialysis, malnutrition, and anemia. The incidence of MAE at 5 years was significantly higher in the high CRP group (36.5% vs. 20.3%  $P=0.007$ ). The COX multivariable analysis demonstrated that the high CRP level emerged as a significant predictor for MAE at 5 years (HR 1.75, 95%CI 1.01-3.03,  $P=0.04$ ).

Among LEAD patients undergoing EVT, a CRP level was significantly associated with a long-term clinical outcome. Further studies are required to test the benefit and safety of anti-inflammatory medication in this population.



## MO-17 Sciatic nerve block to improve the quality of digital subtraction angiography in endovascular therapy

○Natsumi Yanaka, Shinsuke Mori, Yotaro Fujii, Atsuya Murai, Yusuke Setonaga, Toshihiko Kishida, Tomoya Fukagawa, Kohei Yamaguchi, Masafumi Mizusawa, Masakazu Tsutsumi, Norihiro Kobayashi, Yoshiaki Ito  
Saiseikai Yokohama City Eastern Hospital

### 【What's known?】

#### Objective

Digital subtraction angiography (DSA) is an informative method to know the details of vasculature during endovascular therapy (EVT). However, patients' movement during irradiation decreases the quality of DSA. Recently, sciatic nerve block has been often used in our hospital before EVT to reduce pain during the intervention. We thought reduction of pain and motor inhibition by sciatic nerve block potentially improves the quality of DSA. This study is aimed at showing the effect of sciatic nerve block on DSA quality.

### 【What's new?】

#### Method

From February 2023 to January 2024, 234 EVT for chronic limb-threatening ischemia (CLTI) patients were performed in our hospital. We excluded patients with spinal cord stimulation and EVT without DSA use. We categorized the interventions into EVT with sciatic nerve block (43 EVT) and EVT without sciatic nerve block (138 EVT). Ratio of evaluable DSA to total number of DSA was compared between the groups. Evaluable DSA was defined as DSA with clear outline of main vessels of interest.

#### Result

Rate of evaluable DSA was significantly higher in sciatic nerve block group ( $93.2 \pm 10.8\%$  vs.  $74.8 \pm 26.7\%$ ,  $p < 0.0001$ ).

#### Conclusion

Sciatic nerve block probably improves the quality of DSA in EVT for CLTI patients.

## MO-18 Prognostic Impact of Cardiothoracic Ratio in Patients with PAD receiving EVT

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<sup>1)</sup>The Second Department of Internal Medicine, Toyama Uiversity,

<sup>2)</sup>Kouseiren Takaoka Hospital, <sup>3)</sup>Kurobe City Hospital, <sup>4)</sup>Kanazawa Medical University Hospital

### 【What's known?】

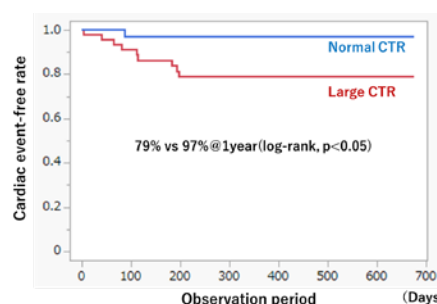
Cardiothoracic ratio (CTR) is linked to efferent cardiac hypertrophy and severity of heart failure. However, the clinical implication of CTR in individuals with PAD remains unknown.

### 【What's new?】

Method: Consecutive patients with PAD, who underwent EVT at 4 centers between January and December 2022, were prospectively enrolled in the Hokuriku PAD Registry, and retrospectively investigated. We examined the impact of large CTR (defined as  $>50\%$ ) on cardiac events, including sudden death, heart failure hospitalization, and ACS following EVT.

Results: A total of 86 patients ( $75.9 \pm 8.3$  years, 72.3% men, 34.9% depend on hemodialysis) were included and followed for  $328 \pm 161$  days following EVT. The large CTR group (N=47) had a higher prevalence of atrial fibrillation and hemodialysis history, higher Fontaine class, lower serum albumin level, and lower eGFR level, along with statistically comparable LVEF levels compared to their counterparts. Large CTR was not associated with limb events and all-cause mortality but was significantly associated with lower freedom from cardiac events (Figure).

Conclusion: The CTR proved a simple and valuable marker for predicting cardiac events after EVT.



## **MO-19 Long-term results of interwoven nitinol stents to treat intragraft stenosis in hemodialysis grafts**

○Chai Hock Chua  
Shin Kong Memorial Hospital

### **【What's known?】**

Intragraft (puncture site) stenosis is a common problem afflicting the arteriovenous graft (AVG). Since the introduction of using supera to treat intragraft stenosis in 2022, a total of 44 patients received the treatment and long-term analysis has not yet been reported.

### **【What's new?】**

This single-center, retrospective, observational study was conducted of patients with failing AVG due to intragraft stenosis treated with an interwoven nitinol stent. End points included target lesion primary patency, access circuit primary patency, assisted access circuit primary patency, and endovascular intervention rate (EIR). In the final result, the interwoven nitinol stent is a very promising treatment for failings AVGs with recurrent intergraft stenoses. The 3-year access circuit primary, secondary, and target lesion patency rates were acceptable, with low reintervention rate. Stent fracture does not occur in areas of needle puncture.

## **MO-20 Development of a Sun Yat-sen sharp recanalization (SYSR) scoring system for thoracic venous occlusive disease in hemodialysis patients**

○Bin Chen, Yonghui Huang  
The First Affiliated Hospital, Sun Yat-sen University

### **【What's known?】**

Sharp recanalization is an alternative and necessary technique for thoracic central venous occlusive disease (TCVOD) in hemodialysis patients who cannot be recanalized using conventional techniques. But sharp recanalization may lead to fatal complications. A reliable scoring system for sharp recanalization of TCVOD in hemodialysis patients is lacking. This study aimed to establish a scoring system to guide therapy in hemodialysis patients with TCVOD.

### **【What's new?】**

Data from 122 TCVOD procedures were analyzed. The use of a sharp device for recanalization was set as the endpoint, rather than actual procedural success. The least absolute shrinkage and selection operator (LASSO) method was utilized to identify independent predictors. The SYSR (Sun Yat-sen University Sharp Recanalization) score was determined by assigning 1 point for each independent predictor of this endpoint and summing all points accrued. This score was then used to stratify all lesions into three categories for sharp recanalization: minor (SYSR score of 0), intermediate (score of 1), and highly recommended (score of  $\geq 2$ ). 10-fold cross-validation was employed to assess the robustness and accuracy of the model. This model accurately predicts the probability of using sharp recanalization and can be applied in cases of thoracic central venous occlusive disease in hemodialysis patients.

## MO-21 A 3-Year Experience of Phlegmasia in a Tertiary Referral Center in the Philippines: A Case Series and Review of Epidemiology, Management, and In-hospital Outcomes

○Kevin Paul DA. Enriquez, Muriel A. Morilla-Buco, Elaine B. Alajar  
University of the Philippines - Philippine General Hospital

### 【What's known?】

Phlegmasia is a rare condition of acute massive venous thrombosis characterized by marked swelling of the extremities and pain with or without cyanosis which may result in limb loss and death. The condition has not been well-described in our setting. This case series reviews the characteristics, course, and outcomes of seven cases of phlegmasia seen in a tertiary referral center from 2021-2023.

### 【What's new?】

Most patients are female with presentation in the 5th decade of life. The left lower extremity is involved in most patients. Commonly it is caused by an underlying malignancy. Therapeutic interventions consisted of anticoagulation, mechanical thrombectomy, venoplasty, stenting, catheter-directed thrombolysis or a combination of these modalities. One patient underwent pharmaco-mechanical thrombectomy and resulted in a favorable outcome. Mortality is high (43%) particularly in patients with venous gangrene, underlying malignancy, and other medical comorbidities. With most patients presenting late in the course in our setting, we recommend that the minimum requirement for initiation of definitive intervention consist of clinical findings, a bedside venous ultrasound, and arterial signals. In addition, knowledge of the disease and early recognition is paramount particularly in the primary healthcare level to decrease the time interval to presentation and to expedite management to improve patient outcomes.

Table 1: Summary of patient characteristics, findings, associated conditions, and outcomes

Case No.	Age (years)	Sex	Presenting Complaint	Duration (days)	Associated Conditions	Findings	Management	Outcome	Follow-up (months)
1	45	F	Swelling of the left lower extremity	3	None	Ulcer, gangrene	Anticoagulation, mechanical thrombectomy	Death	0
2	52	F	Swelling of the left lower extremity	5	None	Ulcer, gangrene	Anticoagulation, mechanical thrombectomy	Death	0
3	48	F	Swelling of the left lower extremity	7	None	Ulcer, gangrene	Anticoagulation, mechanical thrombectomy	Death	0
4	55	F	Swelling of the left lower extremity	10	None	Ulcer, gangrene	Anticoagulation, mechanical thrombectomy	Death	0
5	42	F	Swelling of the left lower extremity	12	None	Ulcer, gangrene	Anticoagulation, mechanical thrombectomy	Death	0
6	50	F	Swelling of the left lower extremity	15	None	Ulcer, gangrene	Anticoagulation, mechanical thrombectomy	Death	0
7	47	F	Swelling of the left lower extremity	18	None	Ulcer, gangrene	Anticoagulation, mechanical thrombectomy	Death	0

## MO-22 Comparison between compression stocking for 7 days and overnight compression stocking after endovenous radiofrequency ablation of superficial vein: A Randomized Controlled Trial

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### 【What's known?】

Although several guidelines recommended compression therapy after EVRFA but the duration of post-procedural is controversial and compression leading discomfort, pain and skin irritation. The timing of post-operative compression has been dubbed into question. The purpose of this study was to investigate efficacy, complications, and patient satisfaction after endovenous radiofrequency ablation (EVRFA) for superficial vein insufficiency with post-operative compression for 7 days and the overnight compression by elastic bandage.

### 【What's new?】

The study is a single-center, prospective, non-inferiority RCT that will enroll patients at Chulabhorn Hospital. Patients with C2-C4 chronic venous disease were randomly assigned to either overnight compression or continuous compression for seven days. At 12 weeks, the primary outcome was ultrasound-determined targeted vein obliteration. the severity score, pain score, complications, and patient satisfaction were all secondary outcome measures.

Of the 60 included patients, assigned randomly (1:1) to overnight compression and to 7-day compression. At 12 weeks, both groups had a 100% target vein occlusion. There was no statistically significant difference in r-VCSS, AVSS, patient satisfaction score, complications, or pain score.

In terms of safety and efficacy, compression after treating C2-C4 with endovenous radiofrequency ablation. the overnight post-procedural compression was non-inferior to post-procedural compression for 7 days.

## MO-23 Clinical Impact of Endovascular Therapy in Stenting for Deep Vein Thrombosis

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

### 【What's known?】

Endovascular therapy (EVT) for deep vein thrombosis (DVT) is indicated for symptomatic acute or intractable iliac-femoral vein thrombosis. Stenting may also be necessary, but data are scarce in Japan because venous stents have not yet been approved. This study purpose is to examine the efficacy and safety of treatment for DVT with stent implantation or not.

### 【What's new?】

This study is multi-center, retrospective and observational study. Consecutive 55 patents undergoing EVT from November 2015 to August 2023 were retrospectively analyzed. The endpoint was whether EVT was required more than once. The mean age was  $63.6 \pm 20.2$  years; male patients was 54.1%; All patient took direct oral anticoagulants; EVT number was  $1.92 \pm 0.70$ . The stent-implanted group were older than the non-stent-implanted group ( $70.6 \pm 13.9$  vs  $59.7 \pm 21.6$ ;  $p= 0.024$ ). And the stent-implanted group avoided multiple EVT procedures compared to the non-stent-implanted group (47.1% vs 76.3%;  $p=0.035$ ). Patency was not different between both groups, and there was no complication. EVT in stenting for DVT was efficacy and safety. Stenting at the time of EVT for DVT was performed more frequently in the elderly but was considered a predictor of avoidance of two or more EVTs.

## MO-24 Stenting is an effective treatment for acquired arteriovenous fistula following deep vein occlusion

○Jun Nakazato, Tetsuya Asato, Yuji Shimabukuro, Nobuhito Yagi, Tadayoshi Miyagi,  
Takanori Takahashi, Minoru Wake  
Okinawa Prefectural Chubu Hospital

### 【What's known?】

Background: Deep venous occlusion (DVO) with arteriovenous fistula (AVF) is a rare clinical condition. Recently, AVF has been identified as a contributing factor to extremity edema in patients with venous occlusion. The treatment of DVO with AVF remains poorly understood. This study aims to explore the treatment of 6 patients who developed acquired AVF after DVO.

### 【What's new?】

Method: This is a retrospective study. We studied 6 patients with acquired AVF after DVO who were screened by ultrasound and computed tomographic arteriography in our hospital. We treated the patients with DVO and acquired AVF using a venous stent as the first strategy.

Result: We treated 5 patients with iliac vein occlusion and 1 patient with subclavian vein occlusion with stenting. In all cases, embolization of the AVF was not performed. The results showed that stenting effectively improved symptoms and reduced AVF shunt volume in all 6 cases.

Conclusion: We conclude that stenting is an effective treatment for relieving symptoms in patients with deep venous occlusion with AVF, eliminating the need for embolization.

## MO-25 Acute limb ischemia at bilateral femoro-popliteal artery

○Meng-Ying Lu

Taitung Mackay Memorial Hospital

### 【Case overview】

A 72-year-old woman with atrial fibrillation was presented to CV OPD for progressive bilateral leg coldness and cyanosis for one week. Her EKG revealed atrial fibrillation with rapid ventricular response, and bilateral popliteal artery weak pulsation, and bilateral dorsalis pedis and post tibial artery pulseless.

### 【Procedure summary】

Angiography via left radial artery showed bilateral distal SFA to TP trunk total occlusion and thrombus formation. We performed bilateral femoral puncture and cross-over approach for bilateral thrombus suction via Rotarex thrombectomy. First, rotarex thrombectomy was performed at left distal SFA, left popliteal artery, and left peroneal artery, and regained TIMI III flow. Then rotarex thrombectomy was performed at right distal SFA, popliteal artery and right ATA, and TIMI III flow regained. After that, we used urokinase with infusion catheter for thrombolysis, and combining with NOAC administration.

### 【Clinical time course and implication (or perspective)】

After four days urokinase continuous injection via infusion catheter, bilateral SFA to below the knee artery TIMI III flow were noted, and only minor residual thrombus remained. However, gastric A2 ulcer with anemia, and right femoral artery pseudoaneurysm were noted 2 days after procedure. Pseudoaneurysm subsided after compression 24hours, and we used PPI and titrate NOAC dose according to serum hemoglobin level.



## MO-26 A case of arteriovenous malformation of upper and lower mesentericarteries

○Qiangqiang Nie, Lei Zheng

China-Japan Friendship Hospital

### 【Case overview】

61s male with arteriovenous malformation of upper and lower mesentericarteries

### 【Procedure summary】

Microcatheter precisely navigates the left colic artery for angiography to identify the target treatment vessel. The microcatheter was placed near the “nest” of distal arteriovenous malformations and injected with 50% anhydrous ethanol solution. The submesenteric artery was then selected for angiography, showing arteriovenous shunt from the sigmoid artery followed by posterior collateral reduction with controlled coil embolization. Two weeks later, a second intervention was performed with a microcatheter placed in the lower mesenteric artery lesion and 4ml of 50% anhydrous ethanol injected. DSA showed that abnormal arteriovenous shunt gradually disappeared.

### 【Clinical time course and implication (or perspective)】

Mesenteric arteriovenous malformation is an extremely rare disease, especially when the upper mesenteric artery and the lower mesenteric artery occur simultaneously. Standard endovascular intervention strategies, usually applied to peripheral arteriovenous malformations, are not feasible due to the inability to establish venous return pathways. Treatment involves direct arterial injection of anhydrous ethanol, requiring precise placement of a catheter at the distal end and careful administration of anhydrous ethanol at low concentrations and slow rates. It is recommended to use multiple treatment methods in stages over a short period of time to effectively control the condition.



## MO-27 Complete thoracic endovascular aortic repair with in-situ fenestration under cerebral perfusion with ECMO - A case report

○Viktoria Poell, Benedikt Reutersberg, Daniela Reitnauer, Lorenz Meuli,  
Alexander Zimmermann

University Hospital Zurich, Switzerland

### 【Case overview】

**Background** Using in-situ fenestration by laser probes in advanced endovascular aortic therapy offers treatment alternatives in the case of high urgency.

**Aim and Methods** In this case-report we present Switzerland's first complete thoracic endovascular aortic repair (TEVAR) with in-situ fenestration, which was performed in January 2024. Informed consent was obtained.

### 【Procedure summary】

**Results** A 71-year-old female presented with aneurysms of the ascending and descending aorta, most likely due to dissemination of *Streptococcus pneumoniae*. Due to high perioperative risks of open approaches, a minimally invasive alternative in terms of TEVAR with in-situ fenestration was planned. The operation was supported with cerebral ECMO protection, starting with a transposition of the left common carotid artery to the left subclavian artery (LSA), followed by transfemoral implantation of the TEVAR from Zone 0 to 3. Subsequently, in-situ laser fenestrations for the brachiocephalic trunk and the LSA were performed. Finally, two thoracic endoprotheses were implanted distally, landing just above the coeliac trunk. CTA detected a small Endoleak type III, which was subsequently regressing. Otherwise, the postoperative course was uneventful.

### 【Clinical time course and implication(or perspective)】

**Conclusions** In limited cases, where standard alternatives are associated with significantly increased morbidity and mortality, the method described offers a relatively safe alternative. Long-term results are not yet available.

## MO-28 A troublesome crossover, dilation, and hemostasis cases

○Shohei Kameyama, Kenji Suzuki, Yuki Fujii, Yumiko Ichihara, Ayaka Endo,  
Naoki Hirata, Tasuku Hasegawa, Toshiyuki Takahashi, Ayaka Yu,  
Kyosuke Hosokawa, Naoki Fujimura, Hirohisa Harada

Saiseikai Central Hospital

### 【Case overview】

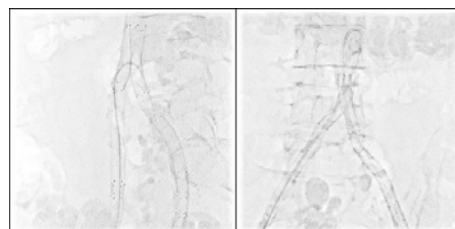
A case was 70-year-old woman on dialysis for end-stage renal disease. SMART 7/100mm had been placed with kissing technique for aorta to bilateral CIA stenosis. And then left EIA ISR occurred, EVT was performed via left brachial artery. Another SMART was deployed to EIA stenosis, and vessel rupture occurred during treatment for SFA CTO. Fortunately, hemostasis was obtained with only balloon tamponade. Moreover, the brachial artery was occluded and surgical repair was needed. Twelve-month later, patient had claudication again, and CT showed stenosis and pseudo-aneurism in SFA.

### 【Procedure summary】

The brachial artery approach was hesitated, so the contralateral femoral artery approach was used. Stenosis was detected from left EIA stent edge to left CFA. SFA was totally occluded, and there was no pseudo-aneurysm. We attempted to cross over from SMART stent strut, but only the 60g guide wire and WINGMAN catheter passed through but catheter did not. We used Tempo UF catheter to exceed the proximal side of the kissing stent and advanced guiding catheter into the left EIA with pull through technique, and dilated with a 6mm balloon.

### 【Clinical time course and implication(or perspective)】

The procedure was completed without adverse events. The patient's claudication improved. We report this case because it was a difficult case in terms of treatment indications, approach, and strategy.



## **MO-29      A case of acute postoperative arterial occlusion after AAA without success of additional Fountain catheterization after surgical thrombectomy**

○Hiroshi Araki

Yokosuka General Hospital UWAMACHI

### **【Case overview】**

The patient was a male in his 60s who presented with acute right lower leg ischemia after AAA surgery and underwent emergency surgical thrombectomy. Due to residual leg ischemia afterwards, endovascular treatment was added.

### **【Procedure summary】**

The right lower leg was not contrasted peripherally in a progressive fashion; IVUS showed no significant thrombus involvement, and the entire artery was narrowed, suggesting the effects of pressure drainage due to compartment syndrome; after ATA, PTA with balloon dilation and localization of ISDN and alprostadil through a thrombus aspiration catheter A Fountain catheter was placed and continuous papaverine infusion was started. However, the Fountain catheter was removed and only the guiding sheath was placed due to occlusion during the night on the same day. The next day, contrast showed residual thrombus at the tip of the sheath, and suction was added.

### **【Clinical time course and implication (or perspective)】**

Unable to confirm ATA/PTA blood flow, a Fountain cuff was placed again and continuous infusion of papaverine + alprostadil + heparin was added, but the cuff became occluded and was removed the same night, making salvage difficult. There were several problems, which we report in retrospect.

## **MO-30      Two cases of sub-acute limb ischemia caused by thrombotic disorders**

○Munenori Ota, Hiroaki Hirase, Ryusuke Yamamoto, Takao Matsui, Yasuhisa Kurita

Takaoka Minami Heart Center

### **【Case overview】**

Case1; 50s male, presented severe claudication on the right limb since more than a week. Embolism due to descending aortic mural thrombus was suspected.

Case2; 50s male, presented severe claudication on the left limb from a few days ago. The cause of the embolism was unknown, but acute occlusion due to thromboembolism was suspected.

Both cases were considered to be subacute limb ischemia due to some kind of thrombotic disorders.

### **【Procedure summary】**

Floating thrombus were found in the SFA in both cases. Blood flow was improved by repeated thrombus aspiration and balloon expansion. One case had repeated reocclusion, but blood flow was improved with the use of heparin and argatroban. The blood aspirated during the EVT coagulated into jelly outside the body, it was shown in Figure.

### **【Clinical time course and implication (or perspective)】**

One case had a minor amputation and the other case had a complete recovery. Both cases had hyperhomocysteinemia caused by low vitamin B6 levels. Hyperhomocysteinemia is considered an important screening test as a cause of thrombotic disorders in ALI cases.



## **MO-31 A case of successful limb salvage by revascularization of occluded artery with peripheral venous perfusion in acute limb ischemia**

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

### **【Case overview】**

A 72-year-old man presented with acute right leg pain and first toe cyanosis. Acute limb ischemia was diagnosed; angiography showed occlusion from the right common femoral artery (CFA) to infrapopliteal arteries. Following surgeon consultation, endovascular treatment was arranged.

### **【Procedure summary】**

Revascularization enhanced blood flow from the right CFA to the plantar arch; nonetheless, the first toe perfusion remained absent due to 1st metatarsal artery occlusion and lack of collateral vessels. The day after treatment, the symptoms recurred with below-the-knee arteries occlusion. Although revascularization was performed again, angiography showed delayed flow with a lack of the first toe perfusion. Insufficient blood flow was deemed the poor outflow resulting from a diminished vascular bed due to venous capillary collapse, and venous revascularization was performed. A catheter via the ipsilateral common femoral vein was advanced to peripheral vein. After injecting saline and vasodilator through the catheter, venography showed peripheral venous dilatation. With the improvement of venous circulation, arteriography showed normalized contrast delay and restored the first toe perfusion via collateral vessels.

### **【Clinical time course and implication(or perspective)】**

The revascularization improved symptoms without reocclusion for 4 months, resulting in limb salvage. Improving venous perfusion as “true” outflow in lesions that cannot be treated with arterial revascularization alone may provide a new approach.

## **MO-32 Endovascular treatment strategy for long segment femoropopliteal artery lesions, On the basis of predecessors**

○Liqiang Cui  
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### **【What's known?】**

Long segment femoropopliteal artery occlusion is a common vascular disease in lower extremity, percutaneous treatment of this arterial segment presents a particular technical challenge and has poor long-term effect. Over the years, the surgical strategy of long segment femoropopliteal artery occlusion has undergone multiple discussions and continuous evolution. This speech mainly review the main technical development of long segment femoropopliteal artery occlusion in our center over the years, and compares a group of patients, which either had drug coated balloon + stent or drug coated stent in the early surgical practice, which included 78 patients who underwent surgery in our center in the years 2020-2023, including 57 patients who used drug coated balloon and remedial stent, and 21 patients who used drug coated stent. There was no difference in the patency rate and major complications between the two groups in the short-term follow-up, and the overall cost of the latter group was relatively small. At the end of this speech, the current mainstream strategies of femoropopliteal artery surgery were summarized.

### **【What's new?】**

The article compared the prognosis of the two groups of patients and analyzed their costs, and reviewed the overall surgical strategy for patients with long segment femoropopliteal artery occlusion.



## MO-33 Pathology of Balloon Angioplasty for Below-the-Knee Arteries in Patients With Chronic Limb-Threatening Ischemia

○Manabu Shiozaki, Norihito Nakamura, Sho Trier, Kazuki Aihara, Yu Sato, Yuji Ikari  
Tokai University

【What's known?】

### Background

Balloon angioplasty was the only treatment options for below-the-knee (BTK) arteries in patients with chronic limb-threatening ischemia (CLTI), however, pathological evaluations after balloon angioplasty has never been performed.

### Methods

Forty-two lower limb arteries from 19 patients (median age, 72 years old; 13 men, 13 on hemodialysis) who underwent autopsy or lower limb amputation were assessed. The BTK arteries were serially cut at 3-4 mm intervals and in total of 683 histological sections were evaluated.

【What's new?】

### Results

Mean duration of the collected BTK arteries after balloon angioplasty was 32 days. Restenosis of the treated lesions which was defined as sections with >75% stenosis was demonstrated in 47.3% (323 sections). Pathological evaluation revealed that sections with restenosis demonstrated higher prevalence of progressive plaque (65.5% vs. 48.1%,  $p<0.0001$ ), medial dissection (68.5% vs. 46.6%,  $p<0.0001$ ) compared with sections with no-restenosis. On the other hand, prevalence of severe medial calcification was significantly lower in sections with restenosis compared with non-restenosis (48.7% vs. 73.6%,  $p<0.0001$ ).

### Conclusions

The current pathological analysis demonstrated that progressive plaque and medial dissection after balloon angioplasty for BTK arteries were associated with higher risk of restenosis in patients with CLTI. Medial calcification was less in sections with restenosis, suggesting protective roll.

## MO-34 Prognostic Impact of Statin in Patients with CLTI and Malnutrition

○Yoshiteru Okina<sup>1</sup>, Yasushi Ueki<sup>1</sup>, Tamon Kato<sup>1</sup>, Takashi Miura<sup>2</sup>, Yushi Oyama<sup>3</sup>,  
Naoto Hashizume<sup>4</sup>, Daisuke Yokota<sup>5</sup>, Daisuke Sunohara<sup>1</sup>, Hidetomo Noumi<sup>1</sup>,  
Tatsuya Saigusa<sup>1</sup>, Souichiro Ebisawa<sup>1</sup>, Kouichiro Kuwahara<sup>1</sup>

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【What's known?】

Malnutrition is frequently observed among patients with chronic limb threatening ischemia (CLTI). The effect of statin for such patients has been poorly investigated to date. We aimed to investigate the impact of statin on long-term outcomes among patients with CLTI and malnutrition.

【What's new?】

Patients with lower extremity arterial disease undergoing endovascular treatment were prospectively included in the multicenter I-PAD registry. For the current study, 126 patients with CLTI were analyzed. The primary endpoint was amputation free survival (AFS) at 5 years. Malnutrition was defined as geriatric nutritional risk index (GNRI) <92 points.

AFS at 5 years was significantly lower in the malnutrition and statin-naïve group (normal nutrition/statin (n=19): 67.9%, normal nutrition/no statin (n=20): 69.0%, malnutrition/statin (n=9): 64.3%, malnutrition/no statin (n=14): 29.8%,  $P<0.001$ ). Multivariable Cox regression analysis revealed that malnutrition without statin emerged as an independent predictor for AFS at 5 years (HR 3.02, 95%CI 1.38-6.58,  $P=0.006$ ).

Statin may be beneficial among patients with CLTI and malnutrition. Further research is required to investigate the effect of statin in this patient subset.

## MO-35 Outcomes of non-flow-limiting spiral dissection after drug-coated balloon angioplasty for de novo femoropopliteal lesions

○Takuya Haraguchi, Masanaga Tsujimoto  
Sapporo Heart Center

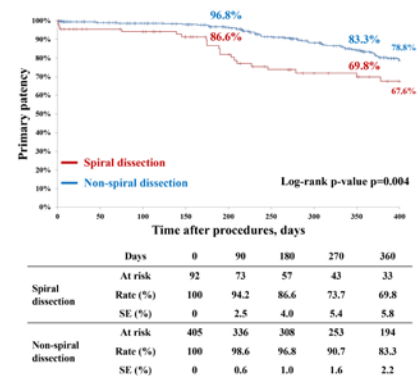
### 【What's known?】

Whether drug-coated balloon (DCB) angioplasty would be effective in spiral dissection (SD) lesions with no flow impairment has not been thoroughly investigated.

### 【What's new?】

The single-center retrospective study assessed the clinical outcomes of non-flow-limiting SD after DCB angioplasty for de novo femoropopliteal lesions. This study enrolled 497 patients with non-flow-limiting SD (n=92) or non-SD (n=405) without bailout stenting. The 1-year primary patency and freedom from target lesion revascularization were significantly lower in the SD group than in the non-SD group (69.8% vs. 83.3%, p=0.004; 78.7% vs. 93.0%, p=0.007). The SD group had a higher incidence of 30-day restenosis than the non-SD group (4.3% vs. 0.5%, p=0.002).

1-year restenosis after SD was associated with chronic limb-threatening ischemia (CLTI) (hazard ratio [HR], 3.36; 95% confidence interval [CI], 1.21-9.36), TASC II D (HR, 3.97; 95% CI, 1.02-15.5), and residual stenosis  $\geq$ 50% (HR, 4.92; 95% CI, 1.01-23.9). Despite normal antegrade flow, the 1-year primary patency rate after DCB angioplasty for de novo femoropopliteal lesions was significantly lower in lesions with SD than those without SD. CLTI, TASC II D, and residual stenosis  $\geq$ 50% were risk factors associated with 1-year restenosis after DCB angioplasty for non-flow-limiting SD lesions.



## MO-36 The association between the percutaneous angioplasty femoropopliteal artery using the drug-coated balloon and bleeding in chronic limb threatening ischemia patients

○Takeaki Kudo, Kenji Ogata, Yuya Asano, Keisuke Yamamoto, Yoshisato Shibata  
Miyazaki Medical Association Hospital

### 【What's known?】

Whether the endovascular treatment using the drug-coated balloon reduces bleeding has been unknown.

### 【What's new?】

The aim of study is to assess the influence of the endovascular treatment (EVT) for femoropopliteal artery using drug-coated balloons on the bleeding in the patients with chronic limb threatening ischemia (CLTI). We retrospectively investigated consecutive 159 CLTI patients which underwent EVT for femoropopliteal artery using drug-coated balloons (98 patients) and drug-eluting stents (61 patients) between January 2018 and December 2022 at single center. We evaluated all-cause mortality and bleeding events at 3 years. Median age was 75.0 [IQR, 70.0 – 85.0] years, male patients was 90 (56.6 %). All-cause mortality occurred in 22 (22.5 %) vs. 8 (14.8 %) at 3 years. Bleeding events were occurred in 13 (13.3 %) vs. 20 (32.8 %). Bleeding complicated by EVT and gastrointestinal bleeding were occurred in 3 (3.1 %) vs. 7 (11.5 %), 4 (4.1 %) vs. 1 (1.6 %), respectively. Multivariate cox hazard analysis revealed that drug-coated balloon was significantly associated with less bleeding events (Hazard ratio 0.44, 95% confidential interval 0.21 – 0.91), which adjusted for sex, hemodialysis, aspirin therapy. In CLTI patients, EVT for femoropopliteal artery using drug-coated balloon appeared to reduce a bleeding.

## MO-37 Association between Cilostazol and Limb Event following Endovascular Therapy for Femoropopliteal Lesion with Chronic Life-threatening Limb Ischemia from LANDMARK registry

○Kazuki Tobita<sup>1</sup>, Eiji Koyama<sup>1</sup>, Hirokazu Miyashita<sup>1</sup>, Keisuke Hishikari<sup>2</sup>, Shinsuke Mori<sup>3</sup>, Tatsuki Doijiri<sup>4</sup>, Yasutaka Yamauchi<sup>5</sup>, Shigeru Saito<sup>1</sup>

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### 【What's known?】

**Background** Patients with lower extremity artery disease (LEAD) with chronic life-threatening limb ischemia (CLTI) had poor prognosis due to severe atherosclerotic change. Cilostazol reduced restenosis and improved limb symptom, however, relation between cilostazol and limb event with CLTI is still unclear.

### 【What's new?】

**Aim** This study aim is to investigate the effect of additional cilostazol for CLTI from LANDMARK registry.

**Methods** This study was a retrospective multicenter registry enrolling consecutive 1378 patients (1777 lesions) treated in Kanagawa (evaLUation of clinical outcome After eNDovascular therapy for feMoropopliteal ARtery disease in Kanagawa: LANDMARK registry). Primary outcome was defined as major adverse limb event (MALE) including all cause death, major amputation and freedom from target lesion revascularization (TLR).

**Results** A total 222 matched pairs of patients were analyzed after propensity score-matched analysis. Patient and lesion background were not different in 2 groups except for aspirin use. MALE was significantly lower in cilostazol group (cilostazol vs non-cilostazol; 42.8 % vs 49.1 %,  $p=0.003$ ). TLR and patency loss were relatively lower in cilostazol group but not significant. All cause death and any other limbs events were not different between 2 groups.

**Conclusion** Cilostazol reduced MALE for patients with chronic life-threatening limb ischemia.

## MO-38 Outcomes of thoracic endovascular aortic repair with physician-manufactured partial micropore stent graft for aortic arch pathologies

○Fenghe Li

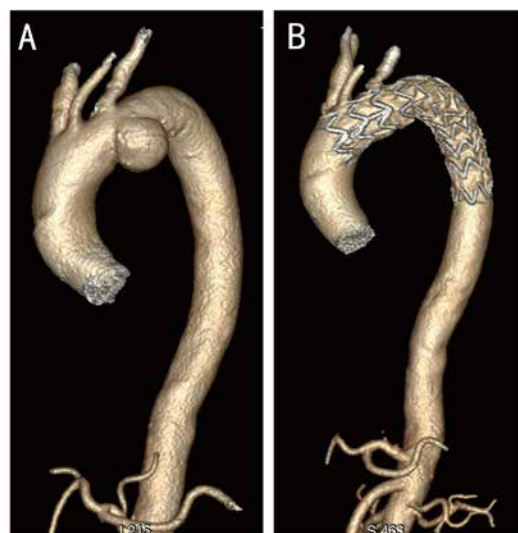
The 1st Affiliated Hospital of Chongqing Medical University

### 【What's known?】

Thoracic endovascular aortic repair has been extensively utilized in the management of thoracic aortic diseases. Numerous efforts have been made to enhance clinical outcomes through the use of stent grafts.

### 【What's new?】

Endovascular treatment of aortic arch pathologies during TEVAR using physician-manufactured partial micropore stent grafts (PMSG) in 56 patients resulted in no mortality, in 100% supra-aortic branch patency and no new stroke.



## MO-39

# Clinical outcomes of acute limb ischemia caused by femoropopliteal stent thrombosis

○Sho Nakao<sup>1)</sup>, Osamu Iida<sup>2)</sup>, Mitsuyoshi Takahara<sup>3)</sup>, Nobuhiro Suematsu<sup>4)</sup>, Terutoshi Suematsu<sup>5)</sup>, Daisuke Matsuda<sup>5)</sup>, Toshiaki Mano<sup>1)</sup>

<sup>1)</sup>Kansai Rosai Hospital Cardiovascular Center, <sup>2)</sup>Osaka Police Hospital Cardiovascular Division,

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<sup>4)</sup>Saiseikai Fukuoka General Hospital Department of Cardiology,

<sup>5)</sup>Matsuyama Red Cross Hospital Department of Vascular Surgery

### 【What's known?】

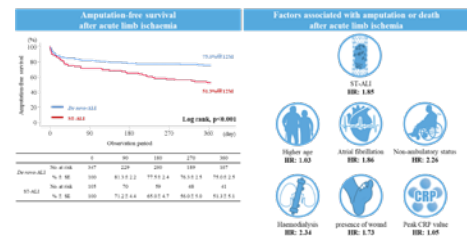
Few studies have focused on acute limb ischemia (ALI) caused by femoropopliteal-stent thrombosis (FP-ST) compared with ALI of other c, and its clinical outcomes are yet to be fully elucidated.

### 【What's new?】

We retrospectively analyzed 108 limbs with ALI caused by FP-ST (ST-ALI) and 391 limbs with ALI caused by other etiologies in the FP arterial lesions (de novo-ALI), treated at 8 centers between September 2011 and March 2023; clinical features and outcomes were compared between the two groups. The outcome measure was 12-month amputation-free survival (AFS), and factors associated with amputation or death were investigated using multivariate Cox proportional hazards regression analysis.

Patients with ST-ALI were significantly more likely to exhibit conventional atherosclerotic risk factors compared to patients with de novo-ALI, whereas patients with de novo-ALI were older (74 vs. 80 years). The 12-month AFS was significantly lower in the ST-ALI group than that in the de novo-ALI group (51% vs. 76%,  $p<0.001$ ). Multivariate analysis revealed that ST-ALI, age, hemodialysis, atrial fibrillation, the presence of a wound, peak C-reactive protein level, and non-ambulatory status were all independently associated with death or major amputation.

In conclusion, patients with ST-ALI had worse clinical outcomes than those with de novo-ALI.



## MO-40

# AngioJet™ Thrombectomy Vs Lysis-Assisted Balloon (LAB) Thrombectomy in Salvaging Thrombosed Renal Access

○Rosanna YT Chow<sup>1)</sup>, Samuel TW Lo<sup>2)</sup>, Skyi YC Pang<sup>1,2)</sup>

<sup>1)</sup>Queen Mary Hospital, Hong Kong SAR, China,

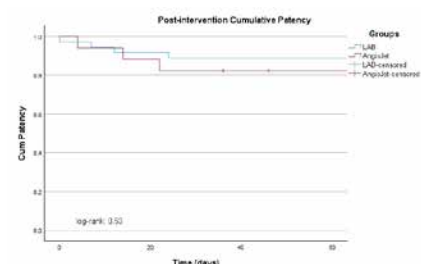
<sup>2)</sup>Pamela Youde Nethersole Eastern Hospital, Hong Kong SAR, China

### 【What's known?】

There is limited comparison data between rheolytic (AngioJet™) thrombectomy and lysis-assisted balloon (LAB) thrombectomy in renal access salvage.

### 【What's new?】

This is a retrospective cohort thrombosed arteriovenous fistula / graft salvage from 1/2022 till 12/2023 in Pamela Youde Nethersole Eastern Hospital in Hong Kong SAR, China. Out of 53 operations, 17 was AngioJet™ thrombectomy and 36 was LAB thrombectomy. Technical success and clinical success of the two groups were 94.1% vs 97.2% ( $p=0.58$ ) and 76.5% vs 91.2% ( $p=0.15$ ) respectively. Overall complication rate of AngioJet™ group was 17.6% and that of LAB group was 2.8% ( $p=0.06$ ). 30-day primary patency, and 30-day post-intervention cumulative patency (PICP) were comparable (76.5% vs 80.6%,  $p=0.73$ ; 82.4% vs 88.9%,  $p=0.51$ ). Access with dilated needling segment  $\geq 10$ mm showed poorer 30-day PICP in Angiojet group (72.7% vs 100%,  $p=0.03$ ). Radiation dose and fluoroscopy time in AngioJet™ group were significantly higher ( $p\leq 0.05$ ). Our study shows that both rheolytic and LAB thrombectomy yield high success rates, though the benefits of rheolytic thrombectomy over LAB thrombectomy is yet to be demonstrated. Different approaches in tackling thrombosed access bears its own benefits and drawbacks.



## MO-41 Study of vascular shape changes in response to helical stent deployment in PVA-H vascular models

○Shintaro Sasaki, Yutaro Kohata, Hiroyuki Kosukegawa, Makoto Ohta  
Ohta lab, Institute of Fluid Science, Tohoku University

### 【What's known?】

Helical stent having a helical centerline is expected to suppress the ISR (In-stent restenosis). The helical shape is designed to generate swirling flow and raise WSS (Wall Shear Stress), expecting the suppression of neointimal hyperplasia and the ISR. The efficacy of suppression of ISR has been shown in previous studies such as Randomized Mimics Trial. However, the deployments of stent were performed into various patients with different mechanical properties of artery. The deformations of arteries to the helical shape after these treatments should be different and the treatment outcome may have the relations. This study aims to find out the geometrical behaviors after helical stent deployments across varying vessel stiffness and geometries.

### 【What's new?】

Helical stents were deployed in vascular models with various stiffness to observe the different deformation. The model is made of polyvinyl alcohol hydrogel (PVA-H), which can vary the thickness and the stiffness. Their expansion rates, curvature and torsion after stent deployment were calculated under the measurement with a micro-CT.

The vessel deformations, especially curvature rather than torsion, differ according to their thickness and stiffness. The results show the outcome of treatment may depend on the the deformations.

## MO-42 Integrated Multi-Omics Profiling Reveals Neutrophil Extracellular Traps Promote Aortic Dissection

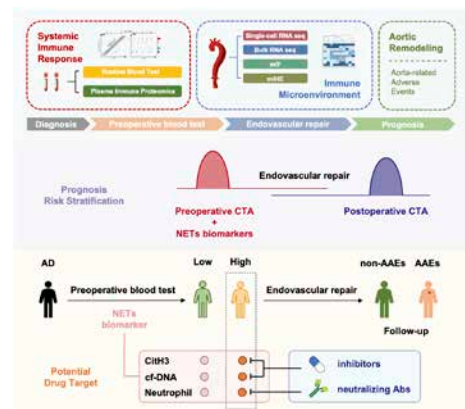
○Yufei Zhao  
Zhongshan Hospital Fudan University

### 【What's known?】

Adverse aortic remodeling increases the risk of aorta-related adverse events (AAEs) after thoracic endovascular aortic repair (TEVAR) and affects the overall prognosis of aortic dissection (AD). It is imperative to delve into the exploration of prognostic indicators to streamline the identification of individuals at elevated risk for postoperative AAEs, and therapeutic targets to optimize the efficacy of TEVAR for patients with AD.

### 【What's new?】

We performed proteomic and single-cell transcriptomic analyses of peripheral blood samples and aortic lesions, respectively, from patients with AD and healthy subjects. We performed *in vivo* experiments to further confirm the effect of inhibiting NETs. Kaplan-Meier and Cox regression analysis were used to identify independent risk factors for AAEs. Integrated multi-omics profiling identified highly phenotype-associated macrophages, which frequently interacted with neutrophils via CXCL3/CXCR2 axis, and promoted neutrophil extracellular traps (NETs) in driving and fueling the development of AD. Increased NETs formation is a defining feature of systemic immunity and aortic microenvironment of AD. Furthermore, we demonstrated that the level of citrullinated histone H3 (CitH3), a NETs associated marker, could serve as a risk factor for AAEs following endovascular therapy. Inhibiting NETs formation through the blockade of CitH3 alleviated the progression and rupture of AD in mice.



## MO-43 Successful deep venous arterialization in a CLTI patient with previous femoral-tibial bypass

○Chai Hock Chua

Shin Kong Memorial Hospital

### 【Case overview】

A 35 year old man, who was a heavy smoker, developed intermittent claudication over left leg since 2 years ago and has been repeated treated with endovascular treatment (EVT) for chronic limb threatening ischemia (CLTI Rutherford 3). However, repeat stent occlusion caused exhaustion of all viable vessels and surgical bypass was performed one year ago with femoral-posterior tibial artery bypass with saphenous vein graft. One year later, sudden onset of ischemia pain was noted in one day and occlusion of bypass graft was found.

### 【Procedure summary】

We tried to perform revascularization to the bypass graft but failed due to much thrombus and highly intima hyperplasia. At last, we determined to perform percutaneous deep vein arterialization with hybrid procedure, performing thrombectomy first over common femoral artery, then creating an arteriovenous fistula between tibial plantar vein and the SVG graft, enlining the SVG graft with covered stent from fistula to common femoral artery, finally restoring the blood to venous plantar arch.

### 【Clinical time course and implication(or perspective)】

After several additional angioplasties, blood flow to the venous plantar arch gradually developed, leading to well perfusion to arterial plantar arch too. The symptom was much relieved and patient could return back to normal life and now still under medical control.

## MO-44 Investment procedures work in CTO EVT

○Szu-Chi Chien<sup>1)</sup>, Takuya Haraguchi<sup>2)</sup>

<sup>1)</sup>Changhua Christian Hospital, <sup>2)</sup>Sapporo Heart Center

### 【Case overview】

76 year old male with hx of DM and hypelipidemia. He had unhealing painful ulceration at dorsal side of lower leg. So he visited our clinics.

### 【Procedure summary】

1st time, we use command w/ CXI mc, successful advance to distal ATA, tip injection showed MC in lumen. But ended with failed wiring to plantar loop. Attempt PTA, but wiring into subintimal space. Try distal puncture, but failed. After vey careful check the tip injection, we found a collateral via ATA to PTA. Very careful wiring with SION 300 wire with caravel MC, sucessful wiring back to PTA. Then antegrade kissing cross. Successful EVT after balloon angioplasty for PTA. Staged EVT 2 months later. But PTA total occluded again by angiogram. As you can see, the BTA portion of PTA gets better. After failed antegrade wiring, we succeeded in retrograde puncture and do kising wire cross to plantar loop. Tip injection showed the plantar loop was acceptable and retrograde wiring from plantar loop to mid ATA, Then antegrade wire tip in to distal MC. Then finalized with successful balloon angioplasty.



### 【Clinical time course and implication(or perspective)】

The wounds get better and patient's capability to walk.

**MO-46      A case of EVT for residual stenosis after femoral artery thromboendarterectomy in which IVUS was useful for diagnosis and treatment**

○Shunsuke Maruta, Syogo Ayusawa, Fumimasa Tabata, Tomomi Koizumi  
Mito Medical Center

**【Case overview】**

The patient was an 83-year-old woman. She had claudication (Rutherford classification 2) in the right lower extremity and a low ABI of 0.59. CT angiography showed an occlusive lesion in right common femoral artery (CFA) and She had femoral artery thromboendarterectomy.

However, postoperatively, claudication remained, and ABI did not improve from 0.53 to 0.59. CT angiography showed residual severe stenosis in right proximal CFA, and it was thought the lesion could not be completely resected, so after consultation with the vascular surgeon, we performed EVT for revascularization.

**【Procedure summary】**

Angiogram showed right CFA presented a flat stenosis. Guide wire (GW) easily crossed to the Rt CFA and IVUS was performed. The GW had passed through the dissection cavity and the true lumen was compressed by the false lumen and hematoma. Another GW was successfully guided into the true lumen under IVUS guidance. After pre-dilation, we finalized with INPACT Admiral (6.0mm/40mm). The dissection cavity was no longer visible, and the procedure was completed with a very good acute gain.

**【Clinical time course and implication(or perspective)】**

Postoperative ABI increased to 0.85 and claudication improved. The lesion was presumed to be a clamp injury caused by thromboendarterectomy, and we report a case in which IVUS was useful for diagnosis and treatment.

## MO-47 A Case of Difficulty in Treating Complete Occlusion of the SFA with Advanced Calcification

○Koichi Yoshitake, Atuso Namiki, Masayuki Shibata, Ken Arai  
Kantoh Rosai Hospital

### 【Case overview】

A 75-year-old female presenting with CLTI (Rutherford 5) following endarterectomy on the CFA, with a long-segment occlusion accompanied by advanced calcification in the left SFA.

### 【Procedure summary】

During the first session, as the guiding catheter (GC) from the contralateral side didn't pass the bifurcation of CFA, a 5Fr GC was inserted from the left popliteal artery, and attempts were made solely through a retrograde approach using a 0.018-inch system. However, passage was unsuccessful, and terminating the procedure. In the second session, an antegrade approach was established by pulling the GC from the contralateral side through the sheath of the ipsilateral retrograde puncture, surpassing the bifurcation. For the retrograde approach, a 6Fr GC was inserted from the ipsilateral popliteal artery. Attempts were made to pass through using both a 0.035-inch system and a 0.014-inch system. For the challenging advanced calcification, calcium debulking was performed using a Wingman and 0.035-inch GW tail, succeeding in passing through the true lumen. Subsequent difficulties in device passage were overcome using the BADFARM technique, ultimately leading to the placement of VIABAHN and successful revascularization of the SFA.

### 【Clinical time course and implication (or perspective)】

The improvement in pain at rest and the minimum value of 49 mmHg for the SRPP is considered satisfactory.

## MO-48 Rendezvous-PIERCE technique: establishing a channel through severe calcification in infrainguinal arterial lesions using needle rendezvous

○Takuya Haraguchi  
Sapporo Heart Center

### 【Case overview】

A 68-year-old male with ischemic rest pain attributed to BKA occlusions.

### 【Procedure summary】

Revascularization for the severely calcified occlusion of the anterior tibial artery (ATA) was attempted. The anterior guidewire successfully reached the middle of the occlusion. However, the microcatheters and balloons failed to cross the calcified lesion at the proximal ATA. Although a retrograde approach via the distal ATA was attempted, the retrograde devices failed to pass through the calcification in the middle of the ATA. To address this, Rendezvous-PIERCE was used to modify calcification in the proximal ATA. Initially, a 20-gauge, 10-cm needle was inserted retrogradely and advanced to the tip of the antegrade guidewire. The needle was retrogradely inserted into the vessel to modify the intimal calcification from the needle insertion site to the proximal lesion. The Rendezvous-PIERCE allowed the antegrade microcatheter to cross the proximal calcified lesion successfully. The retrograde guidewire was advanced into the antegrade microcatheter for complete externalization. The antegrade balloon successfully crossed and dilated the entire occlusion, and hemostasis was achieved at the needle insertion site. Final angiography demonstrated successful restoration of blood flow.

### 【Clinical time course and implication (or perspective)】

The patient's symptoms improved after the procedure. Rendezvous-PIERCE is helpful for modifying complex calcified lesions during the wiring of occlusive lesions.





## MO-49 A case of chronic total occlusion in a superficial femoral artery with lotus root-like appearance

○Ken Arai<sup>1,2)</sup>, Koichi Yoshitake<sup>2)</sup>, Masayuki Shibata<sup>2)</sup>, Atsuo Namiki<sup>2)</sup>, Toshiro Shinke<sup>1)</sup>

<sup>1)</sup>Showa University Hospital, <sup>2)</sup>Kanto Rousai Hospital

### 【Case overview】

An 82-year-old male, whose left ankle-brachial index (ABI) was 0.74, presented with intermittent claudication. Angiography showed total occlusion in the distal part of the left superficial femoral artery (SFA).

### 【Procedure summary】

After a 6-Fr Destination catheter was inserted into left femoral artery, a 0.014-inch Gladius guidewire was crossed the SFA lesion. Intravascular ultrasound (IVUS) revealed lotus root-like appearance and Gladius guidewire wasn't crossed the center of the blood vessel. Instead, by performing the IVUS-guided wiring-re-entry techniques, a 0.014-inch Astato XS 9-12 guidewire was successfully crossed in the center. We performed pre-dilatation with a 6.0/20mm cutting balloon and adequately dilated with a 6.0/100 mm balloon. Finally, we dilated with a 6.0/100mm drug-coated balloon.

### 【Clinical time course and implication(or perspective)】

After the procedure, left ABI increased to 1.02, and the symptom of intermittent claudication was improved. We report a rare case of chronic total occlusion in SFA with lotus root-like appearance.

## MO-50 Impact of below-the-knee run-off artery in patients with lower extremity artery disease who underwent endovascular therapy using drug-coated balloons for femoropopliteal lesions

○Takehiro Yamada<sup>1)</sup>, Takahiro Tokuda<sup>2)</sup>, Naoki Yoshioka<sup>3)</sup>, Akio Koyama<sup>4)</sup>, Ryusuke Nishikawa<sup>5)</sup>, Kiyotaka Shimamura<sup>6)</sup>, Takuya Tsuruoka<sup>7)</sup>, Hiroki Mitsuoka<sup>8)</sup>, Yusuke Sato<sup>9)</sup>, Takuma Aoyama<sup>1)</sup>

<sup>1)</sup>Central Japan International Medical Center, <sup>2)</sup>Nagoya Heart Center,

<sup>3)</sup>Ogaki Municipal Hospital, <sup>4)</sup>Toyota Memorial Hospital, <sup>5)</sup>Kyoto University Hospital,

<sup>6)</sup>Shizuoka General Hospital, <sup>7)</sup>Ichinomiya Municipal Hospital, <sup>8)</sup>Aichi Medical University Hospital,

<sup>9)</sup>University of Fukui Hospital

### 【What's known?】

Clinical outcomes in patients with poor below-the-knee (BK) run-off artery during drug-coated balloon (DCB) treatment for femoropopliteal lesions has not been well studied.

### 【What's new?】

This retrospective multicenter observational study enrolled 291 consecutive patients with lower extremity artery disease who underwent endovascular therapy with DCBs for femoropopliteal lesions between January 2018 and December 2021. Patients were classified into four groups based on the number of BK arteries. Primary patency (PP), freedom from clinically driven target lesion revascularization (CD-TLR), freedom from amputation, all-cause mortality at 24 months were investigated. Recurrence predictors at 24 months were also assessed. Of 291 patients, 43 had three BK run-off arteries, 98 had two, 117 had one, and 33 had zero, respectively. No BK run-off artery groups had significantly worse PP, freedom from CD-TLR, and overall survival rates at 24 months than at least one BK run-off artery group. Multivariate analysis showed that chronic limb-threatening ischemia, residual stenosis  $\geq 30\%$ , no BK run-off artery, and Lutonix™ use were independent predictors of PP loss at 24 months. No BK run-off artery was associated with a lower PP rate.

## MO-51 Clinical Outcomes of endovascular therapy with Wingman Catheter system

○Shinya Ichihara, Naoki Hayakawa, Hiromi Miwa, Shunichi Kushida  
Asahi General Hospital

### 【What's known?】

**Background:** Wingman catheter system (Wingman) is a unique device for chronic total occlusion (CTO) crossing and lesion modification. Recently, Wingman's bevel tip inner catheter removal (WINNER) technique has been devised and used for lesion modification.

**Method:** This was a single-center, retrospective study from March 2021 to December 2023. We analyzed 127 EVT cases using Wingman. The primary endpoint was clinical success.

**Result:** Age was 75.9 years. 34.6% was used for below-the-knee (BTK) lesions. The ipsilateral approach was 55.1%, and the bi-directional approach was 21.3%. Wingman 14C, 18, and 35 were 81.9%, 2.4%, and 5.5%. The number of cases in which two Wingman were used was 8.7%. Use for CTO crossing was 68.5%, and WINNER was 49.6%. The combined use of CROSSER and Jetstream was 3.1% and 18.1%. Clinical success was 97.6%. CTO crossing success by Wingman and WINNER was 74.7% and 92.1%. Complication was 6.3%.

**Conclusion:** Our study showed that using CTO passage with Wingman and WINNER procedures may be associated with higher clinical success and relatively low complications.

### 【What's new?】

We report real-world clinical data, as it analyzes data including the novel WINNER technique in addition to the usual use of Wingman.

## MO-52 Is it possible to accurately assess tibial artery lesions in patients with CLTI using duplex echo?

○Tomofumi Tsukizawa  
Kishiwada Tokushukai Hospital

### 【What's known?】

The evaluation of lower limb arteries using DUS is simple, minimally invasive, and often used in actual clinical practice, and DUS is often used to evaluate the below-knee arteries as well. Compared to the aortoiliac artery and the shallow femoral artery, the below-knee artery is a small artery with a more complex arterial runoff. Few reports have verified the accuracy of sonographic evaluation of tibial arteries in CLTI patients.

### 【What's new?】

#### Method

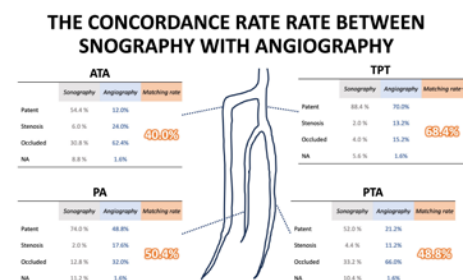
We analyzed 250 new CLTI patients with BTK involvement were screened by DUS, followed by an angiographic evaluation of the tibial artery to assess its accuracy. The primary outcome of this study was to examine the concordance rate between DUS and angiography.

#### Result

The mean age was 75.6 years, 54.8% of patients were ambulatory and 43.6% were on dialysis. Rutherford classification 4/ 5/ 6 were 7.6/ 76.8/ 15.6%, respectively. Clinical stages of WIFI classification 1/ 2/ 3/ 4 were 31.2/ 21.6/ 25.6/ 21.6%, respectively. The concordance rate of lesion evaluation between DUS and angiography was 68.4% in ATA lesion, 68.4 % in TPT lesion, 48.8% in PTA lesion and 50.4% in PA lesion respectively.

#### Conclusion

Assessment of tibial artery lesions using DUS in real-world CLTI clinical practice was less accurate.



## MO-53 Comparative 2-year clinical outcomes of paclitaxel-eluting stent and paclitaxel-coated balloon in small femoropopliteal artery lesions

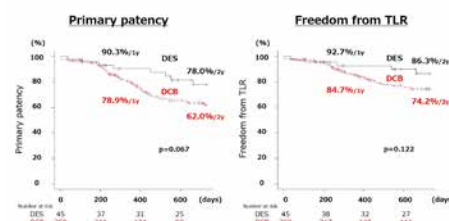
○Masanaga Tsujimoto, Takuya Haraguchi, Tsutomu Fujita  
Sapporo Cardio Vascular Clinic

### 【What's known?】

The effectiveness of drug-eluting stents (DES) and drug-coated balloons (DCB) in treating femoropopliteal artery lesions is well established. Although recent reports have shown a higher patency rate for DES than DCB, comparative studies on small vessels are limited. This study aimed to compare the 2-year clinical outcomes of DES and DCB in de novo small femoropopliteal lesions in real-world practice.

### 【What's new?】

The current study is a single-center, retrospective, observational study. From January 2019 to December 2021, 298 patients (mean age 77.4 years, males 49.0 %) with 303 lesions were treated using DES (n= 45) and DCB (n= 258) for de novo small femoropopliteal lesions (distal reference vessel diameter under 5 mm). The primary endpoint was 2-year primary patency (PP). The secondary outcome was 2-year freedom from target lesion revascularization (FFTLR). The results showed no significant difference in 2-year PP between the DES and DCB groups (78.0% vs. 62.0%,  $p=0.067$ ). Similarly, the incidence of 2-year FFTLR in the DES group was significantly similar to the DCB group (86.3% vs. 74.2%,  $p=0.12$ ). Consequently, 2-year clinical outcomes were comparable for DES and DCB used to treat de novo small femoropopliteal lesions in real-world practice.



## MO-54 Effectiveness and Safety of Trans Collateral Angioplasty (TCA) in Endovascular Treatment (EVT) of Intrapopliteal Lesions

○Yoshinori Tsubakimoto, Takashi Mabuchi, Takashi Okura, Yumika Tsuji,  
Syunta Taminishi, Masao Takigami, Makoto Saburi, Jyun Shiraishi  
Japanese Red Cross Kyoto Daini Hospital

### 【What's known?】

In endovascular treatment (EVT) of intrapopliteal (IP) lesions, antegrade approaches alone may not achieve procedural success, sometimes necessitating retrograde approaches. However, in the guidelines of the Japanese Circulation Society, distal puncture is considered the first choice for retrograde approach, and there is limited evidence regarding Trans Collateral Angioplasty (TCA).

### 【What's new?】

This is a single-center retrospective observational study. From January 2020 to December 2022, consecutive series of 62 lesions where TCA was performed during EVT in the IP region were enrolled. We examined procedural success rate, DP utilization rate, channel complications rate during the procedure. The TCA success rate was 77.4% (48 lesions), with a final procedural success rate of 96.8% (60 lesions), and 11.3% (7 lesions) required concomitant use of distal puncture. The channels utilized for TCA were Pedal Arch in 29.0%, Perforator in 21.0%, Communicator in 37.1%, and other channels in 12.9%. Conversely, channel injuries were observed in 4.8%, channel occlusion in 1.6%, and spasm in 1.6%. In EVT for IP lesions, TCA proved to be an effective option in cases of antegrade wiring failure, with channel-related complications being rare.

## MO-55 Restenosis morphology of inframalleolar stenosis lesions in patients with chronic limb-threatening ischemia ~result from the MAVERIC study~

○Riho Suzuki<sup>1)</sup>, Shuko Iwata<sup>2)</sup>, Yuichiro Hosoi<sup>3)</sup>, Yuki Tanaka<sup>4)</sup>, Michinao Tan<sup>2)</sup>, Yutaka Dannoura<sup>1)</sup>, Takao Makino<sup>1)</sup>, Hisashi Yokoshiki<sup>1)</sup>

<sup>1)</sup>Sapporo City General Hospital, <sup>2)</sup>Tokeidai Memorial Hospital,

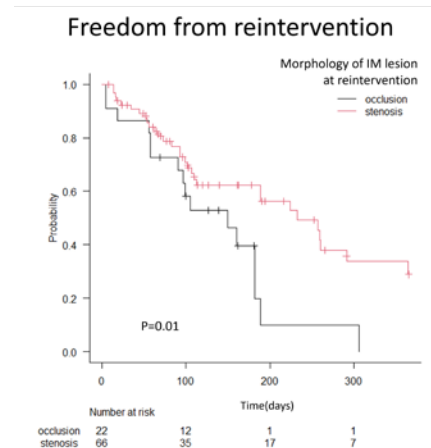
<sup>3)</sup>Sapporo Higashi Tokushukai General Hospital, <sup>4)</sup>Sapporo Kosei Hospital

### 【What's known?】

Although there are reports on revascularization of occlusions in the inframalleolar (IM) lesions, there are no reports of clinical outcomes specific to stenosis in the IM lesions. This study aimed to evaluate the clinical outcomes of IM stenosis lesions and confirm the morphology at the reintervention.

### 【What's new?】

We conducted a retrospective, multicenter, nonrandomized analysis of 194 patients with chronic limb-threatening ischemia (mean age, 74.2 ± 10.7 years; male, 67.0%; diabetes mellitus, 72.7%; dialysis, 56.7%, Rutherford 6, 21.1%) who had stenosis in IM lesion distal the target IP lesions between January 2018 and August 2022. Amputation-free survival and wound healing rate were 77.1% and 61.7% at one year, respectively. Freedom from reintervention rate was 47.5%. In terms of the morphology of IM lesions at the time of reintervention, 26.8% of cases had progressed to occlusion. The patients with occlusion needed the reintervention sooner than patients who remained stenosis (median reintervention period 150 days vs 232 days, P=0.01). In logistic regression, age > 75, balloon dilatation of IM stenosis, and distal reference vessel diameter of IM lesion < 1mm were revealed as predictors of progression to occlusion. In terms of stenosis in IM lesions, a worsening of lesion morphology was observed. In addition, balloon dilatation has a possibility of progression to occlusion.



## MO-56 Successful limb-salvage by Catheter-directed Thrombolysis in patient with femoropopliteal bypass graft and below the knee artery total occlusion by thrombosis

○Meng-Ying Lu

Taitung Mackay Memorial Hospital

### 【Case overview】

The 68-year-old man with atrial fibrillation, peptic ulcer, CAD, ESRD post regular hemodialysis was presented at OPD due to left lower leg pain and unhealing wound with infection. He has history of bilateral PAD post endarterectomy and bilateral femoropopliteal (FP) bypass surgery two year ago. Multiple unhealing wounds over left pre-tibial and ankle area.

### 【Procedure summary】

PTA revealed left FP bypass graft total occlusion with massive thrombosis without stump. Besides, angiography revealed native femoral artery middle segment total occlusion with thrombosis with trivial collateral flow to ATA. Crossover approach from right femoral artery, and advanced long sheath to left iliac artery. Advance 0.035 GW to native SFA lesion but failed to deliver GW to distal SFA heavy calcified lesion. Then advance GW to enter the bypass graft and deliver it to popliteal artery. Change GW to 0.018 wire and then enter the ATA lumen. After distal injection to confirm the ATA distal TIMI III flow, delivering urokinase infusion catheter from right femoral artery sheath, and parking it from left bypass graft to left ATA.

### 【Clinical time course and implication (or perspective)】

After two days urokinase CDT, left femoropopliteal bypass graft, graft-popliteal artery junction, and BTK artery showed TIMI III flow, and only minor residual thrombus noted in left TP trunk.



## MO-57 Acute iliac artery thrombosis during revascularization of thrombus-containing long calcified occlusion of SFA salvaged by hybrid operation

○Chinapath Vuthivanich, Wuttichai Saengprakai

Division of Vascular and Endovascular Surgery, Department of Surgery Faculty of Medicine Vajira hospital, Navamindradhiraj University, Bangkok, Thailand

### 【Case overview】

81-year-old male patient, presented with unhealed ulcer at Rt.leg for 1 month with rapid progression for 1 week. CTA found long calcified flush occlusion of SFA with reconstitution at P2 popliteal artery and had single peroneal runoff which gives branch to distal PTA at distal part to supply foot.

### 【Procedure summary】

Endovascular revascularization was done via contralateral crossover approach, wire was passed down SFA in subintimal plane and re-entry back into popliteal true lumen with the aid of retrograde popliteal puncture. After balloon dilatation was done, there were intimal flap occlusion at ostium PFA and also distal emboli down to peroneal artery which let to complete occlusion of all outflow vessels causing acute thrombosis of Rt.ilic artery. Open surgical cut down was performed on Rt.groin and thromboembolectomy was done then CFA was repaired with patch angioplasty. Antegrade CFA access was created then balloon angioplasty was done along SFA, popliteal a, peroneal a and ATA-DPA. Drug eluting stents were deployed along ostium SFA down to P2 popliteal a.

### 【Clinical time course and implication(or perspective)】

Good flow through Rt.ilic and femoropopliteal segment down to foot via ATA-DPA and peroneal a-PTA. Wound was improved and had sign of healing after successful revascularization.

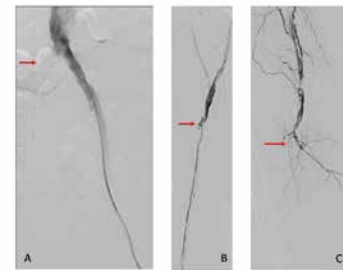


Figure 1 Rt.ilic artery thrombosis (A) complicated from Rt.PFA intimal flap occlusion (B) and distal embolization to single peroneal runoff (C)

## MO-58 Unexpected External Iliac Artery Perforation Associated with Misago Stent Distal Edge Deformation During Trans-Ankle Intervention

○Tomohiro Yoshino, Kei Yonoki, Dai Kawauchi, Mayuko Imamura, Takashi Yamada, Ryohei Fujimoto, Toshiaki Yamanaka, Jun Ida, Takefumi Oka

Tsuyama Chuo Hospital

### 【Case overview】

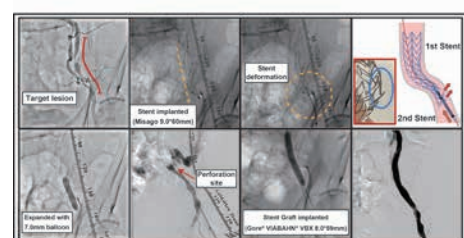
A 73-year-old man was referred to our hospital for bilateral intermittent claudication. A contrast-enhanced computed tomography revealed severe stenosis of bilateral external iliac arteries (EIA), left superficial femoral artery (SFA), and occlusion of right SFA.

### 【Procedure summary】

Trans-ankle intervention was performed due to severe aortic bifurcation angle and to provide one-stage treatment of EIA and SFA lesions. The left EIA lesion was pre-dilated, and a Misago stent was implanted. Subsequently, when an additional Misago stent was delivered, the distal edge of the first implanted stent was found to be deformed. When the stent distal edge was dilated to reshape the stent deformation site, the left EIA was perforated. While ballooning the perforation site, the left common femoral artery was punctured; a 7-Fr sheath was inserted to implant a Gore Viabahn VBX stent graft, and haemostasis was confirmed.

### 【Clinical time course and implication(or perspective)】

The Misago stent, which is frequently used in the trans-radial intervention systems, has been reported to have a "gator-back" appearance on the outer surface during bending because of its long and acutely angled struts. This strut protrusion may cause localized damage because the sharp stent edges dig into the arterial wall, and caution should be exercised during stent deformation such as in this case.



## MO-59 A case of SFA stent graft occlusion that could have been bailed out with the GACHON technique

○Shoichiro Furukawa  
Oita Prefectural Hospital

### 【Case overview】

A 76-year-old male complained of intermittent claudication in his right ankle-brachial index of unmeasurable. He had a history of VIABAHN implantation in the right SFA one year ago. Angiography showed occlusion from the SFA ostium of the proximal stent graft. Surgical treatment was considered, but due to comorbidities, EVT was decided.

### 【Procedure summary】

The lesion length was about 35 cm. Thrombus aspiration and POBA was performed. IVUS showed a thrombotic lesion and focal plaque at the stent edge. The residual thrombus at the distal end involved in the blood flow limit. Additional stent graft was hesitated because the distal lesion was over the P2 segment. We performed a bailout with the GACHON technique using S.M.A.R.T. stent. A stent was used to retrieve the thrombus distal and a stent was placed proximal to the SFA. Spontaneous deployment of the stent during its passage through the stent graft in the long segment resulted in more distal implantation than expected, requiring an additional stent proximally. Blood flow to the periphery was confirmed, and the procedure was terminated.

### 【Clinical time course and implication(or perspective)】

He was discharged without any complications and his symptoms had improved.

## MO-60 A challenging case of VIABAHN infection after the repair of popliteal artery aneurysm

○Kazuhiro Asano, Shunsuke Kojima, Tatsuya Nakama, Kotaro Obunai  
Tokyo Bay Medical Center

### 【Case overview】

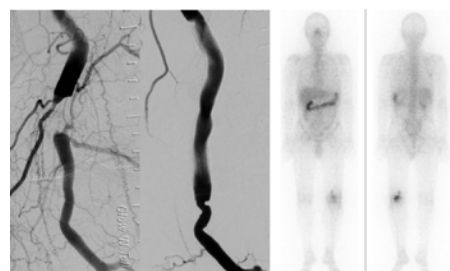
The standard treatment for popliteal artery aneurysms (PAA) is open surgical repair. However, less invasive endovascular treatments have been reported to yield reasonable outcomes, leading to its widespread adoption. We have performed PAA repair using stentgraft in multiple cases, achieving favorable outcomes. Nevertheless, some cases have encountered challenging postoperative courses.

### 【Procedure summary】

A 59-year-old man with claudication in his left leg due to PAA was treated with two VIABAHN™ stentgrafts. After the procedure, the patient suffered from dull pain around the popliteal fossa. A contrast-enhanced CT confirmed perigraft edema, however, without any other signs indicative of infection. However, since the symptoms persisted even after 6 months, we started prednisolone for suspected post-implantation syndrome. Although symptoms initially improved, the patient experienced re-exacerbation of edema accompanied by fever 6 months later. Imaging studies indicated VIABAHN™ occlusion with surrounding abscess. An urgent surgery revealed extensive necrosis and autolysis around the artery and bypassing was made to avoid the inflammatory site. *Staphylococcus haemolyticus* was detected from the cultured samples, confirming the diagnosis of VIABAHN™ infection.

### 【Clinical time course and implication(or perspective)】

Reports of endograft infections and post-implantation syndrome in the context of peripheral artery disease are scarce. We will report this challenging case, including a literature review.



## MO-61 How should we manage the device stuck at the severe calcified lesion?

○Ryoko Nakamura, Masashi Fukunaga, Kunihiro Nishian, Machiko Nishimura,  
Reiko Fujiwara, Daizo Kawasaki  
Morinomiya Hospital

### 【Case overview】

The device stuck during the procedure is one of the major complications for severe calcified lesion. We would like to introduce our real bail out techniques. A 70-year-old female with peripheral artery disease had experienced rest pain at the left toes. Angiography revealed chronic total occlusion from the left mid-superficial femoral artery to peroneal artery with severe calcification.

### 【Procedure summary】

We conducted an endovascular treatment by the bidirectional technique between the left femoral and peroneal arteries. Although the 0.014-inch conventional balloon was crossed into the lesion without any resistance, the balloon ruptured and became stuck without fully expand. The balloon couldn't remove simple way (pull and/or deep engagement of the sheath). Therefore, we attempted the PIERCE technique from body surface to destroy the calcified structure. The balloon was successfully removed after the PIERCE technique. The CROSSER catheter was used to avoid next balloon rupture. However, the CROSSER catheter was also stuck into the lesion. The technique using of the Wingman inner catheter was useful to remove the CROSSER catheter. After the bailout, the lesion was treated using the Jetstream atherectomy device and the Balloon/DCB without any complication.

### 【Clinical time course and implication(or perspective)】

We experienced difference type of device stuck during endovascular therapy for the severe calcified lesion.

## MO-62 Successful Recanalization of a VBX stent graft collapse with endovascular treatment using a bare nitinol self-expandable stent; Case report

○Atsuko Hiramine, Eiji Miyauchi, Ryou Arikawa  
Kagoshima City Hospital

### 【Case overview】

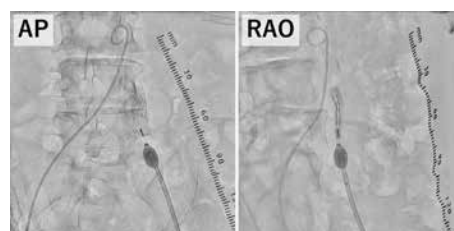
A 74-year-old female with intermittent claudication of the left lower extremity was referred to our department for further evaluation and treatment. Computed tomography revealed focal severe stenosis of the left common iliac artery with heavy calcification. A VIABAHN VBX stent graft 8.0/39 mm (W.L. Gore & Associates, Flagstaff, AZ) was implanted, which resolved the patient's symptom. However, the symptom recurred about three weeks later.

### 【Procedure summary】

Therefore, endovascular treatment was planned again. Angiography showed total occlusion in the VBX stent graft. Intravascular ultrasound revealed that complete collapse of VBX stent graft and rotational fluoroscopy showed stent graft deformation. After thrombus aspiration and additional balloon dilation, a 10.0/60 mm self-expandable stent, S.M.A.R.T. Control stent (Cordis, Miami Lakes, FL, USA), was implanted into the VBX stent graft. The concluding angiography and intravascular ultrasound revealed optimal blood flow and stent expansion. Follow-up ultrasound showed excellent patency without any stent fracture at six-month follow-up.

### 【Clinical time course and implication(or perspective)】

VBX is an excellent device for aortoiliac obstructive disease; however, there is a rare possibility of collapse. Identifying at-risk patients through pre-procedural interviews and examinations is crucial. In the event of collapse, the placement of a self-expandable stent inside the collapsed VBX stent graft can be an effective solution.



## MO-63 First report of stenting in isolated femoral vein

○Wacharaphong Pitaksantayothin<sup>1,2)</sup>

<sup>1)</sup> Faculty of Medicine, Vajira Hospital, <sup>2)</sup> Sapporo Heart Center

### 【Case overview】

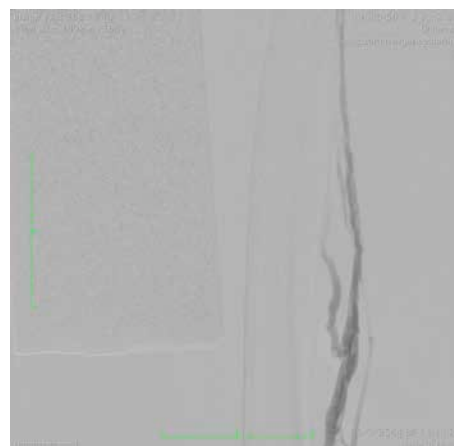
40-year-old man had painful venous ulcer on right gaiter area. Imagings showed right small saphenous vein reflux and filling defect in femoral vein without ileocaval obstruction. To our knowledge, there is no report of isolated femoral vein obstruction.

### 【Procedure summary】

Right popliteal vein was accessed. 0.018 wire crossed the lesion. Predilatation was done. There is no recommendation about size of femoral vein stent. Ten-mm. ViCi stent was deployed at peripheral end but stent shortened left peripheral end uncovered. To get more accuracy, 12mm Vici stent was deployed from confluence of the common femoral vein. Due limited size and length of stents, the third stent bridged the gap between two stents. Because no venous stent left, arterial stent was deployed to cover peripheral end. IVUS found focal popliteal vein stenosis close to accessed site. That lesion was balloon only. Even the small saphenous vein was untreated, pain disappeared the day after operation. The wound healed about 1 month later.

### 【Clinical time course and implication(or perspective)】

The arterial stent fracture 2 years after operation. Ulcer recurred. Right CFV was accessed. Fracture site was ballooned. Wound healed.



## MO-64 The Usefulness and Usage Precautions of Manual Handmade Snares

○Eiji Miyauchi<sup>1)</sup>, Ryo Arikawa<sup>1)</sup>, Naoya Oketani<sup>1)</sup>, Mitsuru Ohishi<sup>2)</sup>

<sup>1)</sup> Department of Cardiology, Kagoshima City Hospital,

<sup>2)</sup> Department of Cardiovascular Medicine and Hypertension, Graduate School of Medicine and Dental Sciences

### 【Case overview】

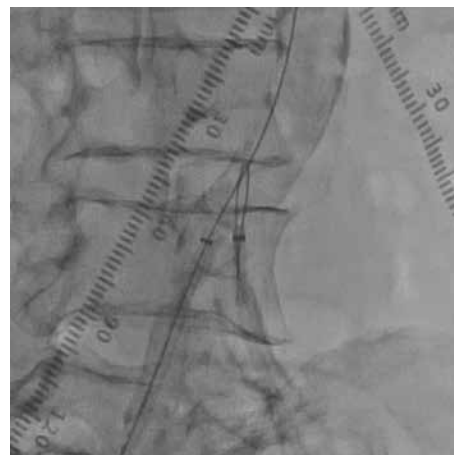
A 70-year-old male was admitted for endovascular therapy with a diagnosis of left lower extremity artery disease. Due to the steep angle of the terminal aorta and the left common iliac artery stenosis, we were unable to perform guidewire cross-over through right common femoral artery. An additional approach via the left common femoral artery was necessary to facilitate the cross-over of the guide wire.

### 【Procedure summary】

Using a 0.035 inch Radifocus guide wire, a handmade snare loop was created. Within the terminal aorta, the guide wire from the right side was passed through the loop of the snare from the left side. However, when attempting to retract the handmade snare into the left sheath, the snare loop broke with half of it entering the sheath, the other remaining inside the vessel. Using biopsy forceps, the broken end was grasped, successfully retracted into the sheath, and removed from the body along with the guide sheath.

### 【Clinical time course and implication(or perspective)】

Manual handmade snares using Radifocus are inexpensive and can be flexibly adapted to each case. However, it is important to use them with caution, as there is a risk of breakage.





## MO-65 Chronic Clinical Findings after Rheocarna Therapy in a Chronic Limb-threatening Ischemia Patient with Inframalleolar Lesions

○Akinori Satake<sup>1)</sup>, Takahiro Tokuda<sup>2)</sup>, Tetsuya Amano<sup>3)</sup>

<sup>1)</sup>Narita Memorial Hospital, <sup>2)</sup>Nagoya Heart Center, <sup>3)</sup>Aichi Medical University

### 【Case overview】

An 87-year-old man who underwent hemodialysis for diabetic nephropathy at 79 years old was referred to our hospital for non-healing ulcers on his right third, fourth, and fifth toes as well as rest pain in the past month. The right ankle-brachial index was 0.94. The right-sided SPPs were 58 in the dorsal area and 36 in the plantar area. The Rutherford classification score was 5. Pre-treatment angiography of the right lower extremity revealed inframalleolar lesions.

### 【Procedure summary】

As distal bypass surgery carried a high risk in this patient, we attempted endovascular treatment of the dorsal and plantar arteries. However, the guidewire could not pass through the lesion because of the severe calcification. Therefore, we decided to treat the patient with Rheocarna.

### 【Clinical time course and implication(or perspective)】

Rheocarna was used for a total of 24 sessions. Post-therapy, demarcation was visible although the ulcers were not completely healed. Angiography performed four days after therapy revealed a significant improvement in microcirculation. Amputation of the right third, fourth, and fifth toes was performed two weeks after the therapy sessions had concluded. One year after therapy, the patient had managed to avoid major amputation and achieved wound healing. At the one-year follow-up, angiography revealed that the microcirculation had been maintained.



## MO-66 The Strategy of Catheter-directed Thrombolysis for Deep Vein Thrombosis with t-PA (Monteplase) in the Era without Urokinase

○Kota Komiyama

Mitsui Memorial Hospital

### 【Case overview】

The case was a female teenager who suffered from left deep vein thrombosis (DVT) and pulmonary embolism (PE) after contracting COVID-19. At first, treatment with anticoagulants was started, and the PE disappeared. However, large amounts of thrombus extending from left lower limb vein to inferior vena cava and her pain in the left lower limb remained, we decided to perform catheter-directed thrombolysis (CDT).

### 【Procedure summary】

After dilatation with balloon, the monteplase was administered for a total of 6 days through a hand-pit catheter deployed in thrombus from the left popliteal vein.

### 【Clinical time course and implication(or perspective)】

Her pain in the left lower limb and swelling disappeared without complications. Although there were many experiences and evidence of CDT using urokinase, the urokinase is no longer available and cannot be used. Moreover, the peripheral thrombus aspiration devices have not yet been commonly available. Therefore, it is necessary for t-PA to perform CDT in the era without urokinase. When our urokinase were out of stock, we have already created protocols for arterial and venous thrombosis with t-PA and, already obtained approval from our ethics committee before this case hospitalized.

## **MO-67      A successful Tunneled Hemodialysis Catheter implantation using a bidirectional technique for superior vena cava stenosis**

○Tetsuya Kobayashi, Kazuhiro Asano, Shunsuke Kojima, Tatsuya Nakama,  
Kotaro Obunai

Tokyo Bay Urayasu Ichikawa Medical Center

### **【Case overview】**

The case is a 70-year-old man. A tunneled hemodialysis catheter (THC) had been inserted through the left subclavian vein at a previous hospital, however, it was removed due to bacteremia caused by *Staphylococcus aureus*.

### **【Procedure summary】**

After antibiotic treatment, a THC was reinserted via the right internal jugular vein (RIJV). Contrast imaging of the superior vena cava (SVC) revealed stenosis. After dilating the stenosis of the SVC with an 8.0-mm balloon, we attempted to insert a THC, but it did not pass through. Furthermore, we tried to increase passability using a stiff wire, but it was unsuccessful. Therefore, we decided to switch to a bidirectional approach. A 7Fr sheath was inserted through the right femoral vein, and the wire advanced from the RIJV. The wire was grasped with a snare catheter and externalized. A THC was passed by pulling the wire caudally while dilating the stenosis with an 8.0-mm balloon.

### **【Clinical time course and implication (or perspective)】**

There has been no previous report of inserting a THC using a bidirectional approach, and we report this case based on a review of the literature and the results of THC insertion at our hospital.

## **MO-68      Withdrawn**

## MO-69 Successful Removal of a Dislodged Central Venous Port Catheter in Coronary Sinus with the Combined Use of a Pigtail Catheter and a Loop Snare: A Case Report on a Novel Retrieval Technique

○Hideyuki Yonezawa<sup>1)</sup>, Eiji Miyauchi<sup>1)</sup>, Mitsuru Ohishi<sup>2)</sup>

<sup>1)</sup>Kagoshima City Hospital, <sup>2)</sup>Kagoshima University Hospital

### 【Case overview】

The patient was a 54-years-old male diagnosed with rectal cancer and a central venous port system was implanted for chemotherapy two years ago. Two weeks before, a chest X ray revealed a fracture in the central venous port system, and it was discovered that a dislodged catheter had moved into the right cardiac chamber.

### 【Procedure summary】

An endovascular retrieval of the dislodged catheter was performed. Due to no accessible free end for retrieval of the dislodged catheter, an attempt to grasp the dislodged catheter with the loop snare alone proved challenging. Therefore, in order to relocate the dislodged catheter for optimal snare grasping, a 5-Fr pigtail catheter was employed. The rounded tip was employed to gently push the body of the dislodged catheter upward. An accessible free end for retrieval was established, enabling the dislodged catheter to be grasped by the loop snare. Ultimately, the dislodged catheter was removed through 8-Fr sheath.

### 【Clinical time course and implication (or perspective)】

If there are no accessible free ends for retrieving the dislodged catheter, the removal becomes challenging. The core principle of our technique with a pigtail catheter revolves around the skillful and secure manipulation of a pigtail catheter within the cardiac chambers or vessels to ensure both safety and efficacy.

## MO-70 Usability of Physician modified endograft using Holoeyes virtual reality system

○Koichi Tamai, Hiroki Arai, Taichi Sano, Yasushi Tashima, Koichi Adachi

Yokosuka General Hospital Uwamachi

### 【What's known?】

Physician-modified endograft (PMEG) is generally used for patients with aortic aneurysms who are at high risk for open surgery, especially in cases where coverage of artery branches is needed. In many facilities, PMEG cases are prepared by determining where fenestration is appropriate for the procedure using 3D printer models. Although 3D models are very useful for making decisions regarding fenestration, they take about one day to create and incur some costs.

### 【What's new?】

Holoeyes virtual reality system enables us to create preoperative 3D images quickly using a head-mounted system. This system also facilitates easy measurement of lengths and angles, with free operation of rotation, expansion, and shrinking within the 3D image. We have successfully utilized this system in more detailed preoperative planning of fenestration sites for three cases of PMEGs (two cases for IIAA and one case for TAAA). This system appears to contribute significantly to the advancement of endovascular therapy.



## MO-71 Near-Infrared Spectroscopy Intravascular Ultrasound Imaging Evaluation of Non-target Lesions in Femoropopliteal Disease

○Yusuke Sato, Yuya Matsunaka  
University of Fukui

### 【What's known?】

Previous studies showed the presence of lipid-core plaque (LCP), even in mild stenosis of coronary arteries, through near-infrared spectroscopy intravascular ultrasound (NIRS-IVUS). However, few studies evaluate the plaque morphology of femoropopliteal disease by NIRS-IVUS. This study aims to assess the plaque morphology of non-target lesions and compare it to target lesions using NIRS-IVUS in patients with femoropopliteal disease.

### 【What's new?】

We conducted a single-center prospective observational study on 13 patients receiving endovascular therapy for femoropopliteal disease. NIRS-IVUS assessment was performed on the whole femoropopliteal arterial segment. We evaluated patient and lesion characteristics. The LCP lesions were divided into the target lesion group (n=11) and the non-target lesion group (n=18). Patient characteristics were notable for advanced age ( $76.7 \pm 6.3$  years), high incidence of male (69.2%), hypertension (84.6%), dyslipidemia (76.9%), diabetes (61.5%), statin use (69.2%). One-half of the patients had LCP lesions only in the non-target lesion (46.2%). For NIRS-IVUS findings, there were no significant differences in the maximum lipid-core burden index in any 4-mm region and the length of LCP between both groups ( $314.6 \pm 178.5$  vs.  $266.7 \pm 123.9$ ,  $p=0.40$ , and  $10.1 \pm 11.7$  mm vs.  $11.3 \pm 7.6$  mm,  $p=0.73$ , respectively). In conclusion, NIRS-IVUS findings demonstrated that the non-target lesions contained LCP to the same degree as the target lesions.

## MO-72 The investigation of safety and efficacy of low molecular weight dextran for removal of blood cells while optimal frequency domain imaging

○Takashi Miwa, Michinao Tan, Shuko Iwata, Masaya Katagiri, Masahiko Obara,  
Kazushi Urasawa  
Tokeidai Memorial Hospital

### 【What's known?】

Low molecular weight dextran (LMWD) is utilized for plasma expander in hypotension and ischemic limb artery and has a risk causing acute renal failure, acute heart failure. LMWD also has an advantage of higher viscosity contributing to make it easy to remove blood cells than saline during optical frequency domain imaging (OFDI) procedure. Peripheral artery is larger and longer than coronary artery in general, so more amount of LMWD is needed to remove blood usually.

### 【What's new?】

From December 2021 to December 2023, 50 endovascular therapy (EVT) cases were performed under guidance of OFDI in our hospital. We investigated the influence of LMWD in OFDI procedure. 26 OFDI cases was performed by using only LMWD (LMWD group) and 3 cases was by using only contrast media (contrast group). The change of serum Cr after the procedure ( $\Delta Cr$ ) was  $-0.067 \pm 0.15$  in LMWD group, and  $0.12 \pm 0.05$  in contrast group ( $p=0.0148$ ).

## MO-73 The impact of vascular response after balloon angioplasty for intermediate infra-popliteal lesion evaluated by optical frequency domain imaging

○Haruya Yamane, Kazuho Ukai, Kuniyasu Ikeoka, Yasunori Ueda  
National Hospital Organization, Osaka National Hospital

### 【What's known?】

Angiographic restenosis after balloon angioplasty is frequently observed in infra-popliteal (IP) lesions, although the report on this issue is limited. This study assessed the vascular response against angioplasty in intermediate IP lesions.

### 【What's new?】

#### (Method)

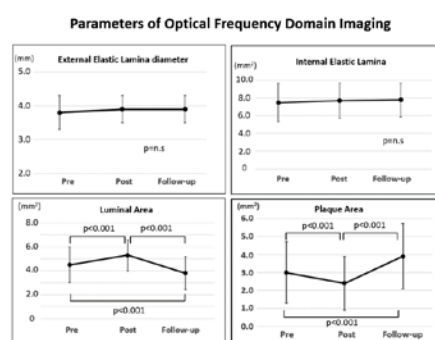
A total of 15 vessels in 13 patients (age  $75 \pm 10$  years, 46% male, 69% diabetes, 69% hemodialysis, lesion length  $22 \pm 10$  cm) with chronic limb-threatening ischemia undergoing successful endovascular treatment (EVT) with optical frequency domain imaging (OFDI) before and after EVT and at follow-up were retrospectively analyzed. The target of observation was the angioplasty performed on de novo intermediate stenosed IP lesions. They were evaluated using cross-sectional OFDI images at 5-mm intervals. Primary outcomes were changes in luminal and plaque areas.

#### (Result)

The mean balloon diameter used in this procedure was  $3.0 \pm 0.4$ mm. The mean interval between EVT and follow-up was  $67 \pm 30$  days. In total, 229 segments were evaluated. The luminal area changed from  $4.5 \pm 1.5$  mm<sup>2</sup> to  $5.3 \pm 1.3$  mm<sup>2</sup> by EVT, and to  $3.8 \pm 1.4$  mm<sup>2</sup> at follow-up ( $p < 0.001$ ). The plaque area changed from  $3.0 \pm 1.7$  mm<sup>2</sup> to  $2.4 \pm 1.5$  mm<sup>2</sup> by EVT, and to  $3.9 \pm 1.8$  mm<sup>2</sup> at follow-up ( $p < 0.001$ ).

#### (Conclusion)

Balloon angioplasty of angiographically intermediate stenosis in the IP lesions worsened the stenosis at follow-up.



## MO-74 Physiological guide Endovascular therapy for new endpoints

○Yoshihiro Iwasaki  
Oumi Medical Center

Endovascular therapy for the femoropopliteal disease is increasingly being performed with the Drug Coating Balloon (DCB). We have added physiological assessment (PA) using peripheral flow fractional flow reserve (pFFR) to determine efficacy. We determined the cut-off value  $>0.92$  after the dilatation with DCB. We report a case in which pFFR assessments was useful to treat severe stenosis in the SFA.

## MO-75 Late acquired plaque morphological changes after drug-coated balloon angioplasty according to underlying plaque components

○Naoki Fujisawa, Takenobu Shimada, Shunsuke Kagawa, Tomohiro Yamaguchi, Kenichiro Otsuka, Takanori Yamazaki, Daiju Fukuda

Department of Cardiovascular Medicine, Osaka Metropolitan University Graduate School of Medicine

### 【What's known?】

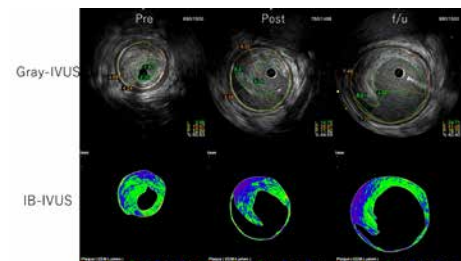
The integrated backscatter (IB) method is an intravascular ultrasound (IVUS)-based color mapping method by which tissue characterization can be performed automatically *in vivo*.

### 【What's new?】

We herein describe a case in which late acquired plaque morphological changes were detected by using IB method after drug-coated balloon (DCB) angioplasty for a femoropopliteal artery.

A 52-year-old man with intermittent claudication who had a short chronic total occlusion in the left superficial femoral artery underwent endovascular therapy. A guidewire was passed through the intraplaque route, and DCB angioplasty was performed. Evaluation using high-definition IVUS was performed after the guidewire passage, after DCB dilation and at 1 months after the treatment. All of the IVUS images obtained were analyzed by the IB method, and it was shown that the plaque volume of fibrosis was compressed just after the treatment (from 494.67 mm<sup>3</sup> to 398.36 mm<sup>3</sup>) and further decreased at 1 months after the treatment (to 362.07 mm<sup>3</sup>) and the plaque volume the lipid pool was not changed at follow up compared to that just after DCB dilation (from 460.03 mm<sup>3</sup> to 456.37 mm<sup>3</sup>).

The analyses from this case suggest that the effect of DCB angioplasty may differ depending on the type of underlying plaque components.



## MO-76 Wifi Classification-Based Analysis Of Risk Factors For Outcomes In Patients With Chronic Limb-Threatening Ischemia After Endovascular Revascularization Therapy

○Fenghe Li

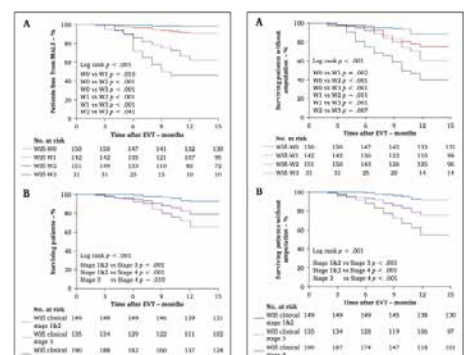
The 1st Affiliated Hospital of Chongqing Medical University

### 【What's known?】

Evaluating limb status with Wifi classifications and assessing patient risks combined with systemic factors were recommended in patients with chronic limb-threatening ischemic (CLTI). However, there was little application evidence of Wifi in the Chinese population. This study aimed to verify the utilization of the Wifi classification in a China patient population, and further identify local and systemic independent predictors for adverse outcomes of CLTI.

### 【What's new?】

This study confirms the predictive ability of Wifi classification for Chinese CLTI patients who underwent EVT. Wound grade was the most sensitive and important risk factor among the three components of Wifi. In addition, systemic factors should also be considered to ensure a more accurate prognosis prediction and appropriate clinical decision-making in CLTI patients.



## **MO-77 Impact of Subjective Global Assessment in Patients with Chronic Limb-Threatening Ischemia who Underwent Endovascular Therapy**

○Takehiro Yamada, Mikihiro Morimoto, Taro Shibahara, Masaru Nagase, Daiju Ono, Keita Suzuki, Makoto Yamaura, Takahisa Ido, Takashi Nakashima, Shigekiyo Takahashi, Takuma Aoyama

Central Japan International Medical Center

### **【What's known?】**

Nutritional assessment in patients with chronic limb-threatening ischemia (CLTI) is important. However, evidence of Subjective Global Assessment (SGA) is limited.

### **【What's new?】**

This retrospective, single-center, observational study enrolled 112 consecutive patients with CLTI who underwent endovascular therapy between March 2011 and December 2021. Patients were classified into three groups based on SGA: grade A, B, and C. The primary outcome measure was overall survival rate at 24 months. The secondary outcome measures were freedom from amputation rate at 24 months, and wound healing rate at 12 months. Predictors of death at 24 months were also investigated. In total, 48, 47, and 17 patients were classified into SGA grade A, B, and C, respectively. SGA grade C had a significantly lower overall survival rate at 24 months than other groups. There were no significant differences in freedom from amputation rate at 24 months and wound healing rate at 12 months. Multivariate analysis showed that SGA grade C, hemodialysis dependent, and failure of target arterial path were the independent predictors of worse survival rate. SGA grade C was associated with a lower overall survival rate in midterm phase in patients with CLTI.

## **MO-78 The risk factors of progression to chronic limb-threatening ischemia after endovascular therapy in intermittent claudication patients**

○Keisuke Shoji, Michitaka Kitamura, Shiori Yoshida, Naotoshi Wada, Tetsuya Nomura, Natsuya Keira, Tetsuya Tatsumi

Department of Cardiovascular Medicine, Kyoto Chubu Medical Center

### **【What's known?】**

There are limited evidences about the risk of progression to chronic limb-threatening ischemia (CLTI) in patients with intermittent claudication (IC) undergoing endovascular therapy (EVT).

### **【What's new?】**

This was a single center, observational, retrospective study. We assessed patients who initially complained IC and underwent first EVT from April 2013 to October 2022. We evaluated risk factors of regarding progression to CLTI after EVT in these patients. We identified 340 limbs of 258 patients (mean age: 76 years old, males: 70.5%, hemodialysis: 13.2%). In lesion characteristics, femoropopliteal lesion was 58%, chronic total occlusion was 32%, and one or no below-the-knee runoff vessel (poor-runoff) was 25.1%, respectively. During median follow up time of 1562 days, 9.3% patients (including non-treated limbs) and 6.8% treated limbs progressed to CLTI. Median time to the diagnosis of CLTI was 859 days and mean number of EVTs before the onset of CLTI was  $1.5 \pm 0.2$ . Multivariate regression analysis demonstrated poor-runoff [odds ratio (OR): 6.32,  $p < 0.01$ ] and hemodialysis [OR: 4.32,  $p < 0.01$ ] were the significant risk factors of progression to CLTI of treated limb. In conclusions, poor-runoff and hemodialysis were the risk factors of the progression to CLTI in treated limbs of IC patients, and careful follow-up including foot care is required.

## MO-79 Clinical impact of Rheocarna<sup>®</sup> therapy on wound healing in patients with chronic limb-threatening ischemia presenting refractory tissue loss

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### 【What's known?】

Despite the widespread use of a novel low-density lipoprotein apheresis, Rheocarna<sup>®</sup>, as an adjunctive therapy for the treatment of chronic limb-threatening ischemia (CLTI), the clinical impact of this therapy on wound healing in patients with CLTI presenting refractory tissue loss who had suboptimal results post-endovascular therapy (EVT) has not been systematically studied.

### 【What's new?】

This was a single-center retrospective study enrolling 24 consecutive CLTI patients (average age: 72 ± 10 years, male: 75%) with tissue loss (Rutherford 5: 92%) undergoing Rheocarna<sup>®</sup> therapy after EVT with suboptimal results. Outcome measure was complete wound healing defined as the achievement of complete epithelialization of all wounds without major amputation. Rheocarna<sup>®</sup> therapy was initiated for 8 patients due to the revascularization failure and 16 patients due to early recurrence after angioplasty. Fifteen of the 24 patients completed without interruption. During median follow-up of 2.1months, wound healing rate was 53.3%, while mortality rate was 25%. The average skin perfusion pressure (SPP) significantly improved after a 1-month cycle of Rheocarna<sup>®</sup> therapy (from 38 ± 14 to 52 ± 18 mmHg, p=0.005). Although the mortality rate of complex CLTI patients was high, the adjunctive use of Rheocarna<sup>®</sup> therapy in these patients was effective in promoting wound healing and increasing the SPP.

## MO-80 Poor short-term outcomes for prognostic high-risk patients with chronic limb-threatening ischemia undergoing endovascular therapy

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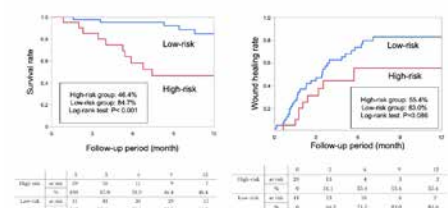
### 【What's known?】

Patients with chronic limb-threatening ischemia (CLTI) may die during the early stages of treatment for wound healing. Aggressive treatments, including endovascular therapy (EVT), may limit the quality of life of such patients.

Prognostic factors (PPs) for CLTI patients undergoing EVT have already been reported (Advanced WIfi stage, male, older age, non-ambulatory, low body mass index, dialysis). We evaluated short-term prognosis and wound healing rates in high- (PPs ≥ 4, n=20) and low-risk (PPs ≤ 3, n=41) patients according to the number of these PPs.

### 【What's new?】

The high-risk group, compared with the low-risk group, had a significantly worse survival rate within one year (46.4% vs. 84.7%, log-rank p<0.001). Fifteen patients died within one year. Of these, seven deaths were cardiovascular deaths, and six were deaths from infectious diseases. Cox proportional hazards analysis showed that WIfi clinical stage 4 (p=0.043, hazard ratio [HR]=4.85) and the male sex (p=0.037, HR=6.34) influenced the prognosis of this population. The high-risk group tended to have a worse wound healing rate within one year than that had by the low-risk group (55.4% vs. 83.0%, log-rank p=0.086).





## MO-81 The Trends in Patients with Chronic Limb-threatening Ischemia Undergoing Endovascular Therapy and its Clinical Outcome across the Era

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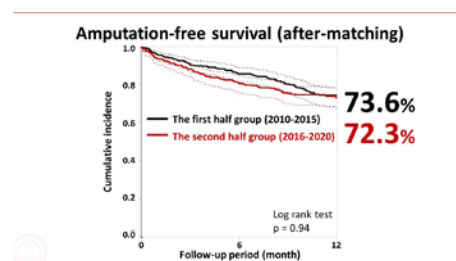
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### 【What's known?】

Endovascular therapy (EVT) for patients with chronic limb-threatening ischemia (CLTI) has made significant progress in terms of device development. However, the trends in patients with CLTI undergoing EVT and its clinical outcome across the era have still unknown.

### 【What's new?】

This is a single-center, retrospective, observational study that enrolled 1470 patients with CLTI who underwent EVT for infrainguinal lesions between April 2010 and December 2020. The treatment periods were divided into two groups; the first half (before 2016) and the second half groups (after 2016, when stent-grafts, drug-coated balloons, and drug-eluting stents were approved). In patient background, the second half was significantly older compared to the first half, with a higher proportion of non-ambulatory, low left ventricular ejection fraction, malnutrition, and more complex anatomical features. On the contrary, the first half group had significantly higher wound severity and lower skin perfusion pressure. After propensity score matching of 336 pairs, Kaplan-Meier analysis showed similar one-year amputation-free survival rates between the first half group (73.6%) and the second half (72.3%) (log-rank  $p = 0.94$ ).



## MO-82 The efficacy and safety of different endovascular modalities for infrapopliteal arteries lesions: single-center experience

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### 【What's known?】

Endovascular treatment has become the first-line therapy for infrapopliteal artery occlusive disease (IPOD), while the optimal endovascular method remains to be determined. A retrospective study to simultaneously compare the outcomes of different modalities for IPOD.

### 【What's new?】

We retrospectively analyzed endovascular procedures of infrapopliteal arterial lesions ( $n = 450$ ) performed in 360 patients at our institution between December 2021 and January 2022, involving nine endovascular modalities or combinations [balloon angioplasty (BA), drug-coated balloon (DCB), drug-eluting stent (DES), atherectomy device + BA (AD + BA), AD + DCB, balloon-expandable bare metal stent (BMS), self-expanding stent (SES), absorbable metal stents (AMS), and inorganics-coated stent (ICS)] were included. 97% overall technical success, yielded 98% for stenosis and 95% for occlusions. TASC II classification had no impact on success rates. Freedom from clinically driven target lesion revascularization (TLR) after 6 and 12 months was 88.3% and 77.2%. TLR was comparable for TASC A to C lesions and no difference was observed comparing groups of moderately complex TASC A/B lesions and more complex TASC C/D lesions. Freedom from TLR was significantly lower in very complex TASC D lesions. Multivariate analysis identified TASC D lesions, Fontaine class III and IV, and occlusive lesions as predictors for TLR.

## MO-83 The Effectiveness of the Firtrap wire at the use of the JETSTREAM atherectomy device

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### 【What's known?】

Although the Jetstream atherectomy devices is available in Japan, some complications have been reported. The aim of this study was to assess the effectiveness and safety with the JETSTREAM in combination with Nipro's Firtrap-wire peripheral protection device.

### 【What's new?】

**Methods:** The study employed the Nipro Institute lower extremity circulation model and the JETSTREAM. Size of the device used XC2.4/3.4mm. The JETSTREAM underwent activation and evaluation at two points: 15cm and 30cm from the tip of the Firtrap-wire. The evaluation of the experiment was as follows.

JETSTREAM Orbiting action. Orbiting action and atherectomy effect using a calcified stenosis model. Wire damage after atherectomy actuation. The activation of the device at the proximal end of the Firtrap-wire.

**Result:** Orbital action caused axial blurring, which was reduced by close contact and actuation of the device to the calcified lesion model. No difference in atherectomy effect was observed, but wire injury occurred at different site than the atherectomy site. Filter breakage was easily caused by activation proximal to the Firtrap-wire.

**Conclusion:** During insertion of the firtrap-wire, it is important to maintain a specific amount of lumen area. When atherectomy, it is necessary to keep a certain distance from the filter site.

## MO-84 Effectiveness and Safety of the PINC Technique for Severe Calcified Infrapopliteal Artery Occlusive Disease

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### 【What's known?】

**Purpose:** We investigated the current implementation status and clinical outcomes of percutaneous intraluminal needle cracking (PINC) in cases where infrapopliteal artery occlusive disease (IPOD) impedes the passage and dilatation of balloon catheters, even after successful guidewire crossing, due to severe calcification.

### 【What's new?】

**Methods:** Our study included a total of 68 consecutive lesions (BTK/ BTA: 52 / 16 lesions) in 60 patients who underwent PINC for IPOD between January 2019 and December 2022. If insufficient expansion of the balloon is observed even after performing the PINC using a 20G needle, additional PINC was carried out by upsizing to an 18G needle.

**Results:** The PINC was performed, including 51 lesions (75.0%) with balloon delivery failure, 6 lesions (8.8%) with microcatheter delivery failure, and 11 lesions (16.2%) with balloon dilatation failure. Successful balloon passage was achieved in all lesions, but two lesions remained insufficient dilatation. A slow or no distal flow phenomenon was observed in 19 lesions (27.9%), and as a result of the sub-analysis, poor distal runoff was considered the primary determinant of the flow restriction.

**Conclusion:** The PINC is a safe and effective technique for severe calcified IPOD that obstructs the passage or expansion of balloon catheters.

## MO-85 JETSTREAM Atherectomy versus Aggressive Wire Recanalization in Calcified Atheroma and Dilatation Treatment in Superficial Femoral Artery Assessed by Optical Frequency Domain Imaging

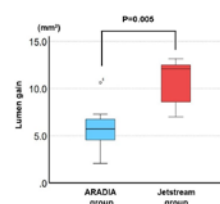
○Koji Kuroda, Masanori Okuda, Takafumi Todoroki, Masamichi Iwasaki,  
Souichiro Yamashita, Junichi Imanishi, Wataru Fujimoto, Makoto Takemoto  
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### 【What's known?】

Severe calcification is associated with poor patency in EVT procedures. To overcome this calcification lesions, aggressive wire recanalization in calcified atheroma and dilatation (ARCARIA) has been established as an effective treatment for calcified nodular lesions. In this context, Jetstream atherectomy was launched last year in Japan. However, the difference of the efficacy of both treatment for nodular calcified lesions has not been clarified.

### 【What's new?】

We aimed to investigate the difference in lumen gain after EVT for calcified nodule between ARCADIA and Jetstream using optical frequency domain imaging (OFDI). From the Awaji Medical Center Lower Extremity Artery OFDI registry, consecutive 14 patients who underwent EVT for CN in superficial femoral artery (SFA) with ARCADIA or Jetstream from 2021 to 2023 were enrolled. 7 patients were performed EVT with JETSTREAM (JETSTREAM group) and the remains were with ARCADIA (ARCADIA group). There has no significant difference between the two groups in OFDI findings before EVT. However, lumen gain after EVT was significantly larger in the Jetstream group as compared to the ARCADIA group (Jetstream group:  $10.63 \pm 2.50 \text{ mm}^2$  vs. ARCADIA group:  $5.86 \pm 2.71 \text{ mm}^2$ ;  $P=0.005$ ). Among the patients with calcified nodular lesions in SFA, Jetstream atherectomy may obtain more lumen gain than ARCADIA.



## MO-86 The efficacy and complications with Rotational Atherectomy for the treatment of femoropopliteal artery lesions with severe calcification

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### 【What's known?】

The usefulness of atherectomy for severely calcified lesions has been suggested.

### 【What's new?】

The aim of study was to evaluate the safety and complications of the Jetstream Atherectomy System for the treatment of the superficial femoral and popliteal (FP) arteries. This was single center and retrospective observational study. A total 10 FP lesions with severe calcification were treated with the Jetstream Atherectomy System. The mean age was  $71.2 \pm 5.3$  years old. 3 lesions (30%) were Rutherford stage 5 to 6. The primary success rate was 100%. In all cases, we used both 1.85 mm and 2.4/3.4 mm catheters. Minimum luminal area was  $14.8 \pm 4.3$  after Jetstream Atherectomy System and drug coating balloon. Slow Flow Phenomenon during the procedure occurred in 40% of cases when 2.4/3.4 mm catheters were used, but was resolved in all cases with thrombus aspiration, balloons, or vasodilators. No bailout stenting or bypass conversions were required. Only one patient had re-occlusion 2 months after procedure, and was re-treated for worsening CLTI. In conclusion, the efficacy and complications with Rotational Atherectomy was acceptable for the treatment of femoropopliteal artery lesions with severe calcification.

## MO-87 Comparison of clinical outcome between bare-nitinol stent and drug-coated stent / drug-eluting stent for severely calcified femoropopliteal lesion

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<sup>1)</sup>Saiseikai Yokohama City Eastern Hospital, <sup>2)</sup>BEASTARS members

### 【What's known?】

Favorable clinical outcomes of a drug-coated stent (DCS)/ drug-eluting stent (DES) implantation for femoropopliteal lesions has been reported. However, the efficacy of drug technology in DCS/DES for severely calcified lesions remains poorly understood. This is because calcification may prevent the penetration of drugs.

### 【What's new?】

We retrospectively analyzed 480 patients who underwent endovascular therapy (EVT) with BNS, DCS, or DES for de novo severe calcified femoropopliteal lesions between November 2017 and February 2021 at 7 cardiovascular centers in Japan. Interwoven stents were excluded from this study and severely calcified lesion was defined as calcification of PACSS 3/4. The patients were classified into two groups based on the type of stent: BNS group n=220 and DCS/DES group n=260. Propensity score-match (PSM) analysis was performed to compare the clinical outcome between the BNS group and the DCS/DES group. A total of 158 matched pairs of lesions were analyzed after PSM analysis. The 3-year primary patency rates are significantly higher in the DCS/DES group than in the BNS group (61.2% vs. 51.7%, p=0.0104). DCS/DES was more effective than BNS even in severely calcified femoropopliteal lesions.