



# Technical Consideration of Endovascular Treatment for Aortoiliac Occlusive Disease Based on a 10-Year Tertiary Hospital Experience: A Retrospective Study

10년간의 3차 의료기관 경험을 바탕으로 한  
대동맥장골동맥 폐색 질환 혈관내 치료의 기술적 고찰:  
후향적 연구

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**Purpose** To examine the technical considerations of endovascular treatment for aortoiliac occlusive disease (AIOD) based on a 10-year experience in Songklanagarind Hospital.

**Materials and Methods** This retrospective cohort study included 210 patients who underwent endovascular treatment for symptomatic AIOD between January 2010 and December 2020. The patients' clinical and lesion characteristics, including technical considerations of the procedure, were collected, analyzed, and stratified using the Transatlantic Inter-Society Consensus (TASC).

**Results** Most patients (80%) in this study had chronic limb-threatening ischemia lesions, with an occlusion rate of 37%. The technical success rate of TASC C & D was lower than that of TASC A & B, 84.4% vs. 99.2%  $p \leq 0.001$ . A technical success rate of 93.3% (14/15) was found for the femoral and brachial approach, compared with a success rate of 89.0% (57/64) for the unibifemoral approach in TASC C & D, without a statistically significant difference ( $p = 0.076$ ). However, the puncture site complications in this route were up to 17.6%, which is the highest rate compared with other techniques. These complications could be treated either conservatively or minimally invasively.

**Conclusion** In cases of failed femoral access, simultaneous femoral and brachial approaches improved the technical success rate of endovascular recanalization of TASC C & D aortoiliac occlusions.

**Index terms** Aortoiliac Occlusive Disease; Technical Considerations; Peripheral Vascular Disease; Transatlantic Inter-Society Consensus

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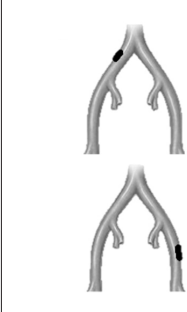
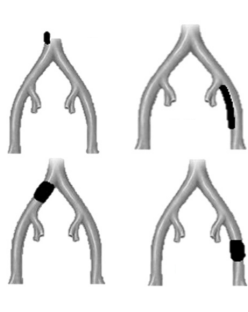
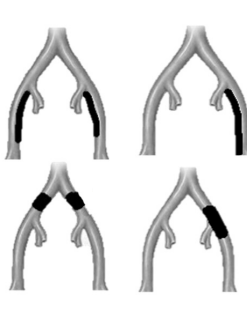
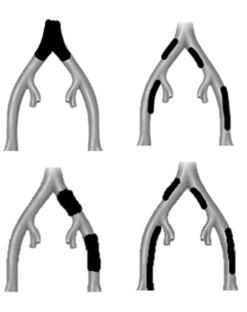
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## INTRODUCTION

The treatment approaches for aortoiliac occlusive disease (AIOD) have recently been updated; although the Transatlantic Inter-Society Consensus (TASC) II statement continues to recommend the treatment of short, focal TASC A & B lesions with endovascular approaches and the treatment of severe AIOD TASC C & D with open repair. Perioperative mortality and morbidity of open repair are substantial, with rates reaching up to 17.0%–32.0% and 12.2%–32.0%, respectively (1, 2). Recently, improvements in therapeutic techniques and devices have resulted in increasing evidence of the effectiveness of endovascular therapy for complex AIOD (3, 4). Most technical failures are associated with unsuccessful crossing of the arterial lumen in chronic occlusions (5). Technical success rates are highly variable and depend on the patient’s baseline and lesion characteristics, as well as on the operator’s experience (6). Therefore, for less-experienced operators, crossing device selection and a variety of approach options are key factors for increasing success rates, especially for complex AIOD (TASC C & D).

This study aimed to assess the technical success rate, technical considerations in terms of medical device selection, route of approach, and complications of endovascular treatments for AIOD.

Fig. 1. TASC II classification.

TASC A	TASC B	TASC C	TASC D
			
Type A lesions	1. Single stenosis less than 3 cm of the CIA or EIA (unilateral/bilateral)		
Type B lesions	1. Unilateral EIA occlusion not involving origin of internal iliac artery or the CFA 2. Single stenosis 3–10 cm in length, not extending into the CFA 3. Total of 2 stenoses 3–10 cm long in the CIA and/or EIA and not extending into the CFA 4. Unilateral CIA occlusion		
Type C lesions	1. Unilateral EIA occlusion involving origin of internal iliac artery and/or the CFA 2. Bilateral 3–10 cm long stenoses of the CIA and/or EIA, not extending into the CFA 3. Unilateral EIA occlusion not extending into the CFA 4. Unilateral EIA stenosis extending into the CFA 5. Bilateral CIA occlusions		
Type D lesions	1. Diffuse multiple unilateral stenoses involving the CIA, EIA, and CFA (usually more than 10 cm) 2. Unilateral occlusion involving both the CIA and EIA 3. Bilateral EIA occlusions 4. Diffuse disease involving the aorta and both iliac arteries 5. Iliac stenoses in a patient with an abdominal aortic aneurysm or other lesion requiring aortic or iliac surgery		

Adapted from Norgren et al. J Vasc Surg 2007;45:S5-S67 (14).

CFA = common femoral artery, CIA = common iliac artery, EIA = external iliac artery, TASC = Transatlantic Inter-Society Consensus

## MATERIALS AND METHODS

This was a single-institution, descriptive, retrospective study conducted in Songklanagarind Hospital. Consecutive patients with AIOD who underwent endovascular treatment between January 2010 and December 2020 were categorized into four groups according to disease severity, following the TASC II classification, as shown in Fig. 1.

Institutional Review Board approval was obtained and the need for informed consent was waived due to the retrospective study design (IRB No. REC. 64-349-7-3).

### PATIENT POPULATION

Patients with symptomatic AIOD who were treated via an endovascular approach were included. Patients with AIOD who had restenotic lesions, underwent diagnostic arteriography with no intention to treat, underwent hybrid procedures, including femoral endarterectomy, or underwent surgical treatments before endovascular treatment were excluded from the analysis. Demographic data included age, sex, history of smoking, underlying diseases, hypertension, diabetes, hyperlipidemia, coronary artery disease, cerebrovascular diseases, and chronic kidney disease, with or without dialysis. Demographic data included preoperative and postoperative Rutherford classifications. Regarding lesion characteristics, occlusion severity was recorded, including occlusion length, calcification, and TASC II classification. The procedure characteristics were recorded in terms of length, technique, initial route of access, crossing wire, and perioperative complications.

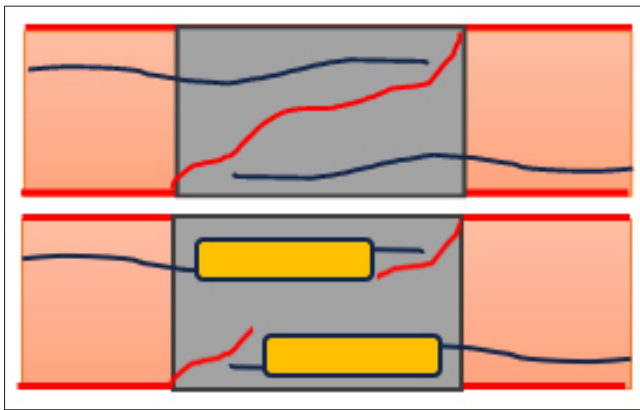
### ENDOVASCULAR PROCEDURES

#### ACCESS SITE

Concurrent femoral artery or infrainguinal lesions were simultaneously treated with occlusive aortoiliac disease. All procedures were performed using an angiography suite. Recanalization was initially attempted using a percutaneous femoral access under ultrasound guidance. Access was performed using an ipsilateral femoral approach via the common femoral artery (CFA), except for the occlusion segment that involved the CFA, for which an approach from the contralateral femoral access was given, followed by a 6 Fr 45 cm long sheath (Durasheath; Medical International GmbH, Dresden, Germany). In cases of failure of femoral access or the lesions involving the bilateral CFAs or distal EIAs, a left transbrachial approach was used. Percutaneous ultrasound-guided puncture of the left brachial artery at the antecubital fossa was followed by placement of a 6 Fr 90 cm long sheath (Durasheath; Medical International GmbH) into the abdominal aorta or iliac artery.

#### CROSSING LESION

A hydrophilic soft-tip 0.035-in glide wire (Radiofocus wire or Glidewire Advantage; Terumo Medical Corporation, Tokyo, Japan) with a 5 Fr straight or slightly curved angiographic catheter (Glidecath; Terumo Medical Corporation) or a 0.018-in glide wire (V18; Boston Scientific Corporation, Arden Hills, MN, USA) with a support catheter (Seeker; Bard Peripheral Vascular, Inc., Tempe, AZ, USA) was applied to cross the lesion in all cases. In cases of difficulty in



**Fig. 2.** The “SAFARI” technique or subintimal arterial flossing with antegrade-retrograde intervention. The SAFARI technique involves both antegrade and retrograde approaches, advanced through the subintimal space from the proximal/distal end of the occlusion. Red line: vessel wall. Gray block: vessel occlusion. Yellow box: balloon.

lesion passage, a chronic total occlusion wire with a 4 Fr slightly curved angiographic catheter (Glidecath; Terumo Medical Corporation) or a support catheter was used, depending on the operator. In some cases of reentry failure from the external iliac or femoral artery to the true lumen, retrieval of the wire in the subintimal space (SAFARI technique) was also performed (7), as shown in Fig. 2. In some patients, we performed a reentry lumen using a balloon technique, such as controlled antegrade and retrograde tracking (CART) or (reverse CART) to reenter the true lumen (Fig. 2). No reentry devices were used at our institution.

## REVASCULARIZATION

After crossing the lesion, pre-dilation angioplasty was routinely performed before advancing a long sheath or stent delivery system across the treated segment. Intraoperative arteriograms were used to measure lesion length and diameter. Self-expandable stents for long-segment stenosis or occlusions and balloon-expandable stents for precise placement in short lesions (mostly at the ostium or proximal common iliac artery) were selected. If the distal aorta involvement was < 2 cm, kissing balloon-expandable stents involving the distal aorta were deployed. However, in complex TASC D, which involves a distal aorta > 2 cm, reconstruction of the aortic bifurcation using the covered endovascular reconstruction of aortic bifurcation (CERAB) technique was performed.

Bare metal stents, either self-expandable or balloon-expandable, were used in simple lesions, while covered stents were used in densely calcified lesions, arterial rupture after balloon angioplasty, or the CERAB technique.

## CLOSURE DEVICE

The puncture site was closed using a percutaneous closure system (Proglide [Abbott Vascular, Temecula, CA, USA], Exoseal [Cordis, Johnson & Johnson, Miami Lakes, FL, USA]), or manual compression, in cases with a contraindication for vascular closure devices. Only manual compression was used for transbrachial access.

## MEDICATION

The peri-interventional antithrombotic regimen varies according to the complexity of the procedure. Usually, 100 units/kg of heparin was administered immediately after achievement

of sheath access. Dual antiplatelet therapy with clopidogrel (75 mg/day) and aspirin (81 mg/day) was recommended for at least 12 weeks after the procedure and was continued with aspirin alone. If a covered stent is deployed, dual antiplatelet therapy is prescribed for 1 year.

## DEFINITION

Technical success was defined as < 30% residual stenosis at completion of angiography. Technical failure was considered in cases of failed all-wire passage.

Procedural-related complications included complications at the access site (occlusion or pseudoaneurysm), acute thrombotic occlusion, iliac rupture, fetal bleeding, and distal embolization within 48 h after the procedure.

Periprocedural mortality was defined as death within 30 days of surgery.

Axial CT angiography (CTA) images were used to assess the calcification grade at the level of the treated iliac artery lesion. Patients were classified into two groups based on arterial calcification, depending on the presence of calcium in < 180° or > 180° of the arterial wall.

## FOLLOW-UP AND ENDPOINTS

The treated aortoiliac lesions were assessed based on clinical symptoms during the first postoperative year and annually thereafter. This study focused on the technical aspects of endovascular treatment for AIOD, and analyzed the technical success rates in all patients according to the TASC II classification. In addition, we analyzed complications, including perioperative mortality and procedure-related complications.

## STATISTICAL ANALYSIS

Analyses were performed using RStudio 1.3.1093 software (<https://rstudio-education.github.io/hopr/starting.html>). Categorical variables were reported as frequencies and percentages. Student's *t*-test was applied to evaluate the differences in means between independent groups, descriptive analysis of technical success and technique considerations, and bar-plot distribution for Rutherford's classification.

## RESULTS

### PATIENT CHARACTERISTIC

Between January 2010 and December 2020, 210 patients with AIOD were treated at our institute. TASC A & B lesions were classified in 120 patients, and TASC C & D lesions in 90 patients. Regarding the overall patient characteristics, 70% were male, regarding comorbidities, diabetes (46%), hypertension (69%), and smoking (51%) were all common. Compared with TASC A & B and TASC C & D, we found that the incidence of diabetes and end-stage renal disease was significantly higher in TASC A & B (55.8% vs. 32.2% and 14.2% vs. 4.4%, respectively) group. However, the number of smokers was significantly higher in the TASC C & D group C & D (63.3% vs. 42.5%, *p* = 0.01).

There was no significant difference between the groups in terms of the Rutherford classification and CLTI, however, the majority of patients were in the CLTI group (80% in TASC A & B and 82.2% in TASC C & D, respectively).

**Table 1.** Baseline Demographics of Patients Undergoing All Procedures Stratified by TASC II Lesions

	Total (n = 210)	TASC A & B (n = 120)	TASC C & D (n = 90)	p-Value
Age	69.06 ± 12.0	69.9 ± 10.9	67.9 ± 13.2	0.217
Sex (male)	148 (70)	78 (65)	70 (77.8)	0.063
Smoking	108 (51)	51 (42.5)	57 (63.3)	0.01
Hypertension	145 (69)	90 (75)	55 (61.1)	0.045
Diabetes mellitus	96 (46)	67 (55.8)	29 (32.2)	0.008
Dyslipidemia	94 (45)	56 (46.7)	38 (42.2)	0.617
Coronary artery disease	67 (32)	41 (34.2)	26 (28.9)	0.508
Cerebrovascular disease	17 (8)	6 (5)	11 (12.2)	0.1
Renal insufficiency (GFR < 60)	28 (13)	17 (14.2)	11 (12.2)	0.837
End-stage renal disease	21 (10)	17 (14.2)	4 (4.4)	0.036
Rutherford's classification				0.192
III	30 (14.2)	13 (11.2)	17 (19.5)	
IV	25 (11.9)	11 (9.5)	14 (16.1)	
V	95 (45.2)	56 (48.3)	39 (39.1)	
VI	50 (23.8)	29 (25)	21 (24.1)	
Chronic limb-threatening ischemia	170 (80)	96 (80)	74 (82.2)	

Data are presented as mean ± standard deviation or n (%).

GFR = glomerular filtration rate, TASC = Transatlantic Inter-Society Consensus

The patient characteristics and baseline demographic data were stratified according to TASC II lesions, as shown in Table 1.

## PROCEDURAL TECHNIQUE CONSIDERATION

### TECHNICAL SUCCESS

The overall technical success was reached in 92% (195/210) of patients; however, the technical success rate of TASC C & D lesions (84.4%, 76/90) was significantly lower than that of TASC A & B lesions (99.2%, 119/120) ( $p < 0.001$ ) (Table 2).

### ROUTE OF ACCESS APPROACH

For the route of access (Table 3), excluding five cases of other approaches, such as the transpopliteal route, 178/205 used the unbifemoral approach, 10/205 used only the brachial approach, and 17/205 used both the femoral and left brachial approaches simultaneously because of failure to cannulate with the uni-bifemoral approach. With the unbifemoral approach, 114/205 (64%) were TASC A & B lesions, and the rest were TASC C & D lesions. In contrast, with the femoral approach combined with the left brachial approach, 15/17 (88.2%) were TASC C & D lesions and 2/17 (11.8%) were TASC A & B lesions. The occlusion rate and lesion length were significantly higher with the femoral and left brachial approaches than with the unbifemoral approach (13/17, 76.5% vs. 55/178, 30.9%,  $p < 0.01$ ). These findings confirmed that patients receiving the simultaneous brachial and femoral approach (femoral and brachial) showed more complex lesions, such as bilateral lesions, more occluded lesions, and more TASC C & D lesions, than those receiving other approaches.

**Table 2.** Lesion Characteristics and Summary of Results for All Procedures Stratified by TASC II Lesions

	Total (n = 210)	TASC A & B (n = 120)	TASC C & D (n = 90)	p-Value
Lesion characteristic				
Distal aorta	24 (11.0)	2 (1.7)	22 (24.4)	< 0.001
Common iliac artery	167 (79.0)	87 (72.5)	80 (88.9)	0.006
External iliac artery	140 (66.0)	63 (52.5)	77 (85.6)	< 0.001
Common femoral artery	28 (13.0)	4 (3.3)	24 (26.7)	< 0.001
Femoropopliteal artery	98 (47.0)	63 (52.5)	35 (38.9)	0.069
Infrapopliteal artery	31 (15.0)	24 (20.0)	7 (7.8)	0.023
Bilateral lesion	86 (40.0)	34 (28.8)	52 (57.8)	< 0.001
Occlusive lesion	79 (37.0)	8 (6.7)	71 (78.9)	< 0.001
Length of occlusion (mm)	99.4 ± 57.4	35.6 ± 26.1	106.6 ± 55.6	< 0.001
Calcification > 180°*	89 (42.0)	52 (42.5)	38 (42.2)	0.402
Technical success rate	195 (92.0)	119 (99.2)	76 (84.4)	< 0.001
Stenting length (mm)	79.4 ± 65.3	57.0 ± 40.5	109.4 ± 79.1	< 0.001
Number of stentings	1.5 ± 1.0	1.3 ± 0.7	1.9 ± 1.2	< 0.001
Self-expandable bare metal stent	74 (35.0)	28 (23.3)	46 (51.1)	0.162
Balloon-expandable bare metal stent	120 (57.0)	75 (62.5)	45 (50.0)	0.606
Self-expandable cover stent	6 (2.8)	1 (0.8)	5 (5.6)	0.092
Balloon-expandable cover stent	30 (14.0)	14 (11.7)	16 (17.8)	0.606
Plain-balloon angioplasty	22 (10.4)	13 (10.8)	9 (10.0)	1
Distal embolization	6 (2.8)	2 (1.7)	4 (4.4)	0.406
Complication †	20 (9.5)	6 (5.0)	14 (15.5)	0.033
Perioperative mortality	8 (3.8)	6 (5.0)	2 (2.2)	0.112
The mean follow-up (mos)	28.5	28.8	28.2	0.876
Rutherford improvement ≥ 2 score ‡	70/176 (33.3)	38/102 (37.3)	32/74 (43.2)	0.519

Data are presented as mean ± standard deviation or n (%).

\*Calcification score along the degree of vessel involvement in circumferential.

† Included complications at the access site (occlusion or pseudoaneurysm), acute thrombotic occlusion, iliac rupture, fetal bleeding, and distal embolization, within 48 hours after the procedure.

‡ Missing data about 34 patients.

TASC = Transatlantic Inter-Society Consensus

**Table 3.** Lesion Characteristics, Technical Success, and Complications Based on the Route of Approach

	Total (n = 205)	Uni-Bifemoral (n = 178)	Only Brachial (n = 10)	Femoral & Brachial (n = 17)	p-Value
Bilateral lesion	84 (41.0)	66 (37.1)	5 (50)	13 (76.5)	0.017
TASC A & B	119 (58.0)	114 (64.0)	3 (30)	2 (11.8)	< 0.001
TASC C & D	86 (42.0)	64 (36.5)	7 (70)	15 (88.2)	< 0.001
Occlusive lesion	74 (36.1)	55 (30.9)	6 (60)	13 (76.5)	< 0.001
Calcification > 180°*	87 (42.4)	75 (42.1)	5 (50)	7 (41)	0.775
Technical success	195 (95.1)	171 (96.1)	8 (80)	16 (94.1)	0.071
Puncture-site related complication †	11 (5.4)	7 (3.9)	1 (9.1)	3 (17.6)	0.078

Data are presented as n (%). Exclusion 5 cases of other approaches, such as the transpopliteal route.

\*Calcification score along the degree of vessel involvement in circumferential.

† Included hematoma or pseudoaneurysm.

TASC = Transatlantic Inter-Society Consensus



**Table 4.** Technical Success Rates Based on the Route of Approach in TASC C & D

TASC C & D	Success		p-Value
	No (n = 10)	Yes (n = 76)	
Uni-bifemoral	7 (10.9)	57 (89.0)	0.076
Only brachial	2 (28.5)	5 (71.4)	
Femoral & brachial	1 (6.6)	14 (93.3)	

Data are presented as n (%).

TASC = Transatlantic Inter-Society Consensus

**Table 5.** Crossing Success Wires in Occlusive and Non-Occlusive Disease

Wire	Occlusive Lesion		p-Value
	No (n = 131)	Yes (n = 79)	
0.035 Terumo	123 (93.9)	43 (56.6)	< 0.001
0.018 V18	7 (5.3)	31 (40.8)	
Other*	1 (0.8)	2 (2.6)	

Data are presented as n (%).

\*0.035 advantage and chronic total occlusion wire.

Focusing only on TASC C & D lesions (Table 4), the initial approach consisted of a uni-bifemoral approach in 64 cases, only brachial approach in 7 cases, both femoral and left brachial approaches in 15 cases, and another approach, such as the trans-popliteal approach, in 4 cases. Among the of 7/64 patients treated with the unbifemoral approach, 10.9% experienced technical failure due to failed wire passage. In these 7 patients with failed wire crossing, an additional brachial approach with both femoral and brachial approaches was used, and technical success was achieved in 93%; however, there was no significant difference between groups.

## GUIDE WIRE CROSSING SELECTION

Regarding guidewire selection (Table 5), the 0.018 wire was more commonly used in occlusive lesions than in stenotic lesions (40.8% vs. 5.3%). A 0.035 wire was more commonly used for stenotic lesions than for occlusive lesions (93.9% vs. 56.6%). We obtained eight cases using the SAFARI technique, but did not record the number of CART or reverse CART techniques.

## MORTALITY AND MORBIDITY

Overall, perioperative mortality occurred in 8 (3.8%). There were 2 (2.2%) perioperative deaths in the TASC C & D group and 6 (5.0%) in the TASC A & B group. Among these eight cases of perioperative mortalities, four were procedure-related and four were not; thus, the overall procedure-related mortality rate was 1.9% (4/210 patients). In the TASC C & D group, both of the 2 mortalities (2.2%) were associated with procedures, such as iliac artery rupture and postoperative bleeding from adjunctive catheter-directed thrombolysis. In the TASC A & B group, two mortalities were procedure-related and consisted of fatal bleeding from the puncture site and wire perforation with retroperitoneal hemorrhage in each patient. Other causes include necrotizing fasciitis, myocardial infarction, and sepsis.



Perioperative complications occurred in 20 (9.5%) patients. Regarding puncture site complications, there were 11 (17.6%) complications (two early pseudoaneurysms at the brachial artery and one case of hematoma at the groin) in the femoral and brachial approaches, 1 (9.1%) complication in the brachial approach (one brachial pseudoaneurysm), and 7 (3.9%) in the femoral approach (three pseudoaneurysms and four hematomas at the groin). The remaining perioperative complications included 2 acute thrombotic occlusions, 2 iliac ruptures, 5 distal embolizations, and 1 case of groin bleeding and distal emboli within 48 h.

## DISCUSSION

Technical success rates are highly variable and depend on the patient baseline, lesion characteristics, and operator experience (6). Therefore, for less-experienced operators, material selection and access options are key factors in increasing success rates, especially for complex AIOD. This study demonstrated a technique to increase the technical success rate in the management of extensive and complex aortoiliac disease, such as the 93.3% technical success rate of the femoral and brachial approaches in TASC C & D. In addition, this study demonstrated the complications of endovascular treatment for AIOD with 10 years of experience.

Previous studies have reported the results of endovascular management of TASC C & D aortoiliac lesions, with a technical success rate from 85% to 100% (8, 9). However, this high technical success rate should be interpreted with caution. Most of these studies included a low rate of occlusion mixed with stenosis; most studies had the number of occlusions treated ranging in TASC C & D from 63.3% to 75.0% (10, 11). We reported a technical success rate of 84.4% with an occlusion rate of approximately 78.9% in TASC C & D (Table 2). This good result was compared with other studies that reported a lower occlusion rate than that in our study.

In this study, the femoral and brachial approaches were performed in 17 patients, the majority of whom TASC C & D lesions, with a technical success rate of approximately 94.1%. Thawabi et al. (12) reported a high technical success rate (97.5%, 40/41) in the transaxillary approach for patients with unsuitable femoral access; however, there was a 5% puncture-site-related complication rate. Millon et al. (6) reported only the brachial approach, with a 93% technical success rate for extensive AIOD involving distal aortic occlusion (13). In this study, we found that only the brachial approach had a lower technical success rate than the femoral and brachial approaches. The two-way approach achieved a technical success rate of 94% for TASC C & D lesions. However, the puncture site complication rate in this route was up to 17.6%, which was the highest when compared with other techniques. Nevertheless, these complications can be treated either conservatively or minimally invasively, without the need for surgery.

Based on the information provided in Table 5, a 0.018 wire was more commonly used for occlusive lesions than for stenotic lesions (40.8% vs. 5.3%). However, it is important to note that this does not necessarily mean that the 0.018 wire is inherently better at crossing occlusive lesions than the 0.035 wire. It is possible that the operator's preference played a role in the selection of the wire used. Therefore, this suggests a preference for using a V18 0.018 wire for occlusive lesions. It is important to interpret these findings with caution and consider other factors that may have influenced wire selection.

This study has several limitations. First, this was a retrospective, nonrandomized study that complied with its own nature. Second, restenosis was not routinely evaluated by imaging such as angiography, ultrasound, or CTA. Clinical follow-up and ankle-brachial index (ABI) were generally administered, and further investigation was performed in symptomatic patients. Third, there was a lack of information on preoperative and postoperative ABI, which was found in only 132 of 210 patients. This method was the leading operator of the endocrine team, resulting in miscommunication between the referring patients. Therefore, we have not described this measurement in detail. Third, endovascular therapy was performed by different surgeons over a decade, which may have led to selection bias in decision-making. This study provides practical and useful information for the management of extensive AIOD.

In conclusion, in cases of failed femoral access, the simultaneous femoral and brachial approaches improved the technical success rate of endovascular recanalization of TASC C & D aortoiliac occlusions.

### Availability of Data and Material

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

### Author Contributions

Conceptualization, N.P.; formal analysis, N.P.; investigation, N.P.; methodology, N.P.; supervision, R.S.; validation, N.P.; writing—original draft, N.P.; and writing—review & editing, N.P.

### Conflicts of Interest

The authors have no potential conflicts of interest to disclose.

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