Axilofemoral bypass in aortoiliac diseases: a case report

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ABSTRACT

Introduction: In patients presenting with severe comorbid conditions and infra-renal aortic occlusion, an extra-anatomic bypass stands as one of the viable revascularization options for limb preservation. Axilofemoral bypass offers a valuable alternative in cases involving hostile abdominal environments or infectious aortic aneurysms. To our knowledge, this is the first report from Indonesia of a case of Aortoiliac Occlusive Disease (AIOD). This case report presents a 39-year-old female patient with complaints of left leg pain persisting for the past seven months.

Case Description: A 39-year-old female patient sought care at our hospital, reporting left leg pain persisting for the past seven months. The pain worsened during physical activity and subsided during rest. She had a history of hypertension for the last eight years but no diabetes or smoking history. The previous hospital had diagnosed her with peripheral arterial disease, prescribing cilostazol and rivaroxaban, which provided only temporary relief. A computed tomography (CT) angiogram revealed occlusion of the abdominal aorta at the level of L2, extending to the left common iliac and right iliac arteries. We elected to perform an axilla-femoral bypass using a polytetrafluoroethylene (PTFE) graft, which yielded satisfactory results. The patient’s progress was monitored for three months postoperatively. This report details the case of a female patient with aortoiliac occlusive disease. Given the absence of insurance coverage for endovascular treatment at our facility, we opted for an axilla-femoral bypass using a PTFE graft, which produced satisfactory outcomes during a three-month follow-up period.

Conclusion: The axilofemoral bypass procedure is fairly safe and easy, especially in patients with a high risk of direct aortofemoral bypass and difficult anatomy. The number of collateral vessels in our patients based on CT scans and endovascular procedures that have not been supported by insurance in our hospital makes us choose the axilofemoral bypass option as the action we decided.

Keywords: Aortoiliac Occlusive Disease, Bypass, Polytetrafluoroethylene, Case Report.


INTRODUCTION

Axilofemoral bypass represents a frequently employed intervention for the management of aortoiliac disease. This procedure is categorized within the spectrum of extra-anatomical pathways encompassing femorofemoral, axilofemoral, obturator, thoracofemoral, and supraceliac-to-iliofemoral bypasses. While its patency rates typically do not surpass those achieved with intra-anatomical abdominal aorta-bifemoral bypass, axilofemoral bypass assumes particular utility in circumstances where the abdominal environment is deemed hostile or in cases involving infectious abdominal aortic aneurysms.

After axilofemoral bypass, long-term complications may manifest, including thrombosis, lower extremity arterial embolism, and infection. The approach to managing limb ischemia following axilofemoral bypass secondary to thrombosis encompasses several treatment modalities, such as femoral artery patch angioplasty, femoropopliteal bypass, and thrombectomy of the artificial vascular conduit. The choice of intervention is contingent upon the severity of symptoms and the underlying cause and extent of thrombosis. This case report has been reported in line with the SCARE Criteria. To our knowledge, this is the first report from Indonesia of a case of Aortoiliac Occlusive Disease (AIOD). This case report presents a 39-year-old female patient with complaints of left leg pain persisting for the past seven months.

CASE PRESENTATION

A 39-year-old female patient presented at our vascular clinic with a history of left leg pain persisting over the past seven months. The pain is exacerbated during periods of rest. Her medical history included hypertension, diagnosed eight years ago, with no concurrent diabetes, smoking habits, or hypercholesterolemia. Previously, at another healthcare facility, the patient had been diagnosed with peripheral arterial disease and had received treatment in the form of cilostazol and rivaroxaban, which provided only transient relief. Because they felt that the treatment had no effect, the patient decided to seek treatment at our clinic. Clinical examination revealed dry,
hairless skin on both lower extremities. In addition, the pulse on the tibialis anterior and tibialis posterior lacked pulsation. Ultrasound examination from the bilateral common femoral artery to the dorsalis pedis revealed monophasic waveforms with no evidence of thrombus formation. Subsequent CT-Angiography (Figure 1) unveiled an occlusion of the abdominal aorta at the level of L2, extending to bilateral common iliac arteries at Lumbar-5. Based on history, physical examination, ultrasound and CT angiography, we diagnosed the patient with AIOD. We decided on surgery because the TASC classification recommends surgery. Due to a lack of insurance support for endovascular treatment at our institution, we performed a left axillofemoral bypass utilizing a 6mm PTFE graft with a 70 cm end-to-side anastomosis using prolene 6/0 (Figures 2 & 3). We decided against aorto-bifemoral bypass due to the large amount of collateral flow that had formed, which would affect the established flow. Therefore, we decided to perform an axillofemoral bypass in addition to insurance issues.

Within 24 hours post-procedure, thrombosis was observed distal to the femoral graft area, necessitating immediate thrombectomy. Successful restoration of pulsation was achieved. Post-procedure, the patient received heparin with a target range of 1.5-2.5 times normal values, in addition to clopidogrel and methylprednisolone. Subsequently, the patient's symptoms gradually ameliorated, enabling improved mobility and extended walking distances without discomfort.

The patient was discharged on the ninth day following the procedure and has since been subjected to one- and three-month follow-up evaluations, during which her complaints exhibited improvement. Ultrasound assessments of the left leg, from the common femoral artery to the dorsalis and tibialis posterior artery, revealed biphasic waveforms indicative of enhanced vascular flow.

DISCUSSION

AIOD affects the aorta and iliac arteries in the infrarenal area. Similar to other arterial diseases, AIOD causes plaque to embolize or the lumen to narrow, which prevents blood flow to the distal organs.\(^6\) One of the surgical techniques typically used to treat AIOD is the axillofemoral bypass. Blaisdell and Hall first proposed axillofemoral bypass surgery in 1963. A patient presenting with bilateral lesions may be able to undergo axillary-bifemoral artery bypass, also known as femorofemoral (femoral-femoral) bypass, concurrently. In situations like a hostile abdomen and infectious abdominal aortic aneurysms, it can be very useful, but its patency rate is typically not better than that of an intra-anatomical abdominal aorto-bifemoral bypass.\(^7\)

We have discussed this case together with the patient. Due to the proximity of the lesion to the left renal artery and the large number of collateral vessels that had formed, we decided to perform a left axillofemoral bypass. We did not complete the right bypass at the same time due to the limited grafts covered by insurance, and the patient did not complain of any pain in the right leg. We are still planning for the right leg bypass for the next stage. Although we faced acute complications such as thrombosis of the graft within 24 hours, we performed immediate thrombectomy and flow was restored. Post-operative follow-up for up to 3 months showed satisfactory results,
There is ongoing discussion over the optimal course of care for people with AIOD, which may involve endovascular therapy or bypass surgery. The purpose of the TASC II guidelines is to help patients make an informed decision when deciding whether to treat their aortoiliac disease with an open or endovascular approach. Endovascular therapy is currently the preferred course of treatment for type A lesions and the most often utilized method for type B lesions. Surgery is advised for type C lesions because of the more severe external iliac disease or bilateral common iliac occlusions. Likewise, surgery is the recommended treatment for type D lesions in cases of significant disease of the common and external iliac arteries. Nonetheless, endovascular therapy has demonstrated several results, even for TASC C and type D lesions.9

Following an axillofemoral bypass, complications can include infection, thrombosis, and lower extremity artery embolism. Similar to other bypass procedures, the primary side effect of axillofemoral bypass surgery is still postoperative thrombosis, which frequently results from distal anastomosis intimal hyperplasia, as happened to our patient. Hypercoagulability, inflow stenosis, and anastomotic stenosis are possible additional reasons for graft thrombosis. On the other hand, recent large-sample studies have demonstrated that the 1-year patency rates for axillary femoral bypass and axillary-bifemoral artery bypass are comparable.10

The severity of the comorbid diseases affects the extra-anatomic bypass’s patency.11 Sustaining long-term patency is challenging. According to various sources, the anticipated patency rates of extra-anatomic bypass at one month, one year, three years, and five years are 93%, 85%, 72%, and 67%.12

Our study is based on a single case presentation, which may introduce selection bias. The decision to perform a left axillofemoral bypass was influenced by factors specific to this patient, including the proximity of the lesion to the left renal artery and the presence of collateral vessels. As such, our findings may not fully represent all cases of aortoiliac occlusive disease, and caution should be exercised when generalizing our results to a broader patient population. Although our study reports follow-up results up to three months postoperatively, it is important to acknowledge that this duration is relatively short. Further studies with longer follow-up periods are needed to assess the durability of the axillofemoral bypass and its long-term impact on patient outcomes.

The limitation of this case report is that we only show one case. It would be better if there were a case series.

CONCLUSION

The axillofemoral bypass procedure is a fairly safe, easy procedure, especially in patients who have a high risk of direct aortofemoral bypass and difficult anatomy and in facilities that do not have endovascular services. The number of collateral vessels in our patients based on CT scans and endovascular procedures that have not been supported by insurance in our hospital makes us choose the axillofemoral bypass option is the action we decided.

CONFLICT OF INTEREST

All authors declare no conflict of interest.

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ETHICAL APPROVAL
Appropriate written informed consent was obtained from the patient for the study and the subsequent publication of this case report.

AUTHOR CONTRIBUTIONS
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Data collection: TCA, H
Analysis: TCA, AA, H, EHC
Manuscript preparation: TCA, AA, H, EHC
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REFERENCES

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