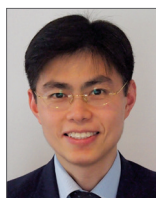


## Endovascular recanalisation of chronic aortoiliac occlusions – will this become the initial treatment of choice?



Paul T.L. Chiam,<sup>1,2\*</sup> MD

1. Mount Elizabeth Hospital, Singapore; 2. National University of Singapore, Singapore

Chronic distal (infrarenal) aortic occlusion with or without iliac artery occlusion is a relatively uncommon or even rare disease, accounting for only 1-8% of patients presenting with aortoiliac atherosclerotic disease<sup>1,2</sup>. Most patients complain of buttock and/or thigh claudication, with smaller numbers presenting with critical limb ischaemia (rest pain, tissue loss, and non-healing ulcer)<sup>2</sup>.

Surgical bypass has been an established treatment modality, either with anatomic bypass (e.g., aorto-bifemoral bypass) or extra-anatomic bypass (e.g., axillo-femoral bypass)<sup>3</sup>. Although aorto-bifemoral bypass has good long-term patency rates of approximately 91% and 87% at five years for patients with claudication and critical limb ischaemia, respectively, the surgical mortality and morbidity are not insignificant (3.3-4.6% and 8.3-13.1%, respectively)<sup>4</sup>. Conversely, extra-anatomic bypass (e.g., axillo-femoral bypass), though less invasive, still carries significant procedural risks and has a poorer patency rate of 71% at five years<sup>5,6</sup>.

More recently, with the improvement of technology and technique, percutaneous endovascular treatment (EVT) for recanalising aortic occlusions has been increasingly performed and reported<sup>1,2,7-12</sup>. This is an attractive method of revascularisation as

it is less invasive and can be performed with local anaesthesia. As many patients with aortic occlusion also have comorbidities that render them at elevated surgical risk (e.g., concomitant ischaemic heart disease, chronic renal failure, etc.), EVT may therefore impose less procedural risk. Literature on EVT for chronic distal aortic occlusion has been limited; several studies enrolled a mixture of patients with distal aortic or iliac artery stenosis or occlusion, and studies which included only distal aortic occlusions had small patient numbers<sup>1,2,7-12</sup>.

In a multicentre registry report published in this issue of AsiaIntervention, Kato et al<sup>13</sup> describe a relatively large cohort of Japanese patients with distal (infrarenal) aortic occlusion (with or without iliac artery occlusion) treated with endovascular therapy. Interestingly, the investigators are all cardiologists who perform both coronary and peripheral artery interventions. A total of 73 patients were initially enrolled; three were excluded from the final analysis as the revascularisation involved only the distal aorta and a single iliac artery (one patient had a previous lower limb amputation, two were patients with ipsilateral foot ulcers), two were excluded because, after successful distal aorta and single

\*Corresponding author: Mount Elizabeth Hospital, 3 Mount Elizabeth, #08-06, Singapore 228510.

Email: paulchiam@heartvascularcentre.com

iliac artery recanalisation, the patients underwent a surgical femorofemoral bypass (hybrid procedure) and one was excluded as treatment was well before the year 2007 (when major restrictions on devices in Japan were in place).

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Although the authors chose not to include these patients in the analysis, it is worthwhile noting that the intended revascularisation procedures were all successful. Furthermore, this practice of selective recanalisation of the distal aorta and a single iliac artery is what many operators would have performed in a “real world” setting so that patients are treated according to clinical indications. Attempting to perform complete distal aortic and bilateral iliac artery recanalisation in all patients may be unnecessary and even harmful in this group of high-risk patients.

Of the remaining 67 patients, 63 had successful revascularisation via EVT. This high procedural success (94%) is in line with previous reports<sup>1,2,7,8</sup>. The high rate of technical success was achieved despite the majority of patients having complex lesions (nearly 85% involved occlusions of the distal aorta and iliac arteries, and half of the lesions showed moderate-severe vessel calcification). In this author’s humble experience, this subset of patients is amongst the most challenging in the field of peripheral vascular intervention due to the technical difficulty (multiple access sites [bifemoral and brachial] required, use of multiple [0.014-, 0.018- and even 0.035-inch] wires, use of support catheters/microcatheters, and use of snares and wire exteriorisation) and the severe complications that can occur. This is even more remarkable considering that each centre performed an average of only four to five such cases throughout the long study duration (less than one case per year which is consistent with the rarity of the disease). Modern-day guidewire technology (in particular dedicated 0.018-inch and 0.014-inch stiff wires) and, arguably, experience and techniques with coronary chronic total occlusion interventions, would likely have contributed to this.

Clinical outcomes were also excellent with only one 30-day mortality (1.4%), that was not procedure-related, and one stroke (1.4%). There were two other complications (2.9%): one distal embolisation that improved with thromboaspiration and one access-site haematoma that required blood transfusion. These outcomes are consistent with previous reports of EVT in distal aortic occlusion<sup>1,2,7-12</sup> that showed a very low mortality rate (0-2%), and compares favourably with surgical bypass<sup>4,6</sup>.

The four unsuccessful procedures were all due to failure of guidewire passage as a result of significant vascular calcification, in keeping with the experience of previous reports<sup>1,8</sup>. Of note, in this series, there was no vessel dissection or perforation, perhaps due to the fact that the majority of procedures were performed using intraluminal wiring with 0.014- or 0.018-inch guidewires. A high rate of intravascular ultrasound usage (80%), which differs from previous reports<sup>1,2,7,8</sup>, may also have contributed to the safe outcomes.

The major limitation of the present study is its short follow-up with only one-year primary and secondary patency rates available.

Most studies have reported patency rates of three to five years as the frequency of restenosis and re-occlusion increases with longer follow-up<sup>1,2,7-9</sup>. Reassuringly, the one-year primary and secondary patency rates (90% and 97%, respectively) reported in this study are consistent with the aforementioned publications, and longer-term patency would be expected to be similar. The authors of the current study should be encouraged to continue follow-up of this group of patients to add to data on the long-term (five- and even 10-year) primary and secondary patency rates after successful EVT of distal aortic occlusions.

It is accepted that the mid- to long-term (three to five years) primary patency of EVT is generally inferior to aorto-bifemoral bypass (66-80% vs 85-95%, respectively), whereas secondary patency rates of EVT (83-98%) appear comparable<sup>1,2,4,7,14</sup>. This is a pertinent point because secondary intervention for EVT restenosis is considered to be technically easier and a less risky undertaking.

Another limitation of this study is its retrospective nature with all the caveats that accompany such a study design. For instance, centres/operators with unsuccessful procedures may have declined to join the registry. It is also uncertain if the good results reported in this study can be reproduced by centres/operators with less extensive peripheral vascular intervention experience. Nonetheless, the authors must be congratulated for publishing the largest cohort of (Asian) patients undergoing EVT for a relatively rare but important clinical condition. One other important unanswered question is whether the use of covered stents, as compared to bare metal stents (used in the present study), in distal aortic occlusions would produce better outcomes, as suggested by some studies<sup>3,15,16</sup>.

In summary, the current study adds to our understanding of EVT for distal (infrarenal) aortic occlusions with or without iliac artery occlusions. As the body of evidence grows, and as technology, techniques and outcomes continue to improve, it is conceivable that EVT for distal aortic occlusion may become the initial therapy of choice for all patients and not just limited to those at increased surgical risk<sup>3</sup>. This would be particularly relevant for experienced centres/operators as the technical success rate of EVT is high and procedural risk and complication rates appear to be low. Further high-quality and long-term data would be required for such a paradigm shift to occur.

**Conflict of interest statement**

The author has no conflicts of interest to declare.

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