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Patency Rates of Arteriovenous Fistula Created Endovascularly in Singapore

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Objectives : Endovascular arteriovenous fistula (EndoAVF) creation is a minimally invasive technique which has surfaced as an alternative to open surgery and was first performed in Singapore in 2021. We aim to report the patency rates of EndoAVF that were created in Singapore.

Methods : Patients eligible for EndoAVF based on vein mapping criteria were offered the option of EndoAVF. All patients who were recruited provided informed consent before undergoing EndoAVF creation. These patients were followed up prospectively for at least 6 months, and their baseline demographics, maturation rates, cannulation characteristics and patency rates were studied.

Results : EndoAVF creation was attempted in 37 patients (19 WavelinQ and 17 Ellipsys) between October 2021 to July 2023. Of which, 33 cases (89.2%) were successful. The success rate for WavelinQ and Ellipsys systems were 89.5% and 88.9%, respectively. The median age of the patients was 62 (35-78) and they were predominantly of Chinese (78%) ethnicity. In terms of etiology of kidney disease, diabetes mellitus was most common (59%) followed by chronic glomerulonephritis (29%). 10 patients (27%) underwent pre-emptive creation. 90.0% of the EndoAVFs were successfully matured and 84.8% had successful 2-needle cannulation for haemodialysis. Two EndoAVFs were abandoned for failed balloon assisted maturation and recurrent thrombosis. The median maturation time was 45 days (26-218). At 6 months, 2 of 33 patients with successfully created EndoAVFs had passed on. The primary, assisted primary and secondary patency rates of EndoAVF were 51.6%, 87% and 93.5%, respectively.

Conclusions : EndoAVF creation in an Asian population appears feasible with good functional patency outcomes at 6 months. This may represent a viable alternative to open surgery in suitable patients. Longer term analysis of patency and intervention rates in a larger population will need to be evaluated in future studies.

Combined data for endoavf creation at 6 months.jpg

Table 1: Combined Data for EndoAVF Creation at 6 months

Variable	N (%) or Median (range)
Success	33/37 (89.2)
Ellipsys	16/18 (88.9)
WavelinQ	17/19 (89.2)
Gender	
Male	23 (62.2)
Age, median	62 (35-78)
Race	
Chinese	29 (78.3)
Malay	7 (18.9)
Indian	1 (0.03)
Etiology of end-stage kidney disease	
Diabetes	22 (59.4)
Chronic glomerulonephritis	11 (29.7)
Hypertension	1 (2.7)
Polycystic kidney disease	2 (5.4)
Uncertain aetiology	1 (2.7)
Pre-emptive AVF creation	10 (27)
Technical Success Rate	33/37 (89.1)
Maturation rate	30/33 (90.9) <i>1 pending cannulation f/u, no scan with >500mls 2 abandoned*</i>
Median Maturation time, days	45 (26-218)
Patency	<i>Out of 33 successful, 2 passed on before 6mths</i>
Primary patency (%)	16/31 (51.6)
Assisted primary patency (%)	27/31 (87)
Secondary patency (%)	29/31 (93.5)

*1 as anastomosis drained to deep brachial vein with no perforator to superficial veins and 1 due to recurrent thrombosis within 2months post creation