

Evaluating midline catheter tip positioning in the mid-subclavian vein: insights from 2024–2025.

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Introduction

Midline catheters (MCs) provide dependable access for intermediate-duration intravenous (IV) therapy while reducing complications from repeated peripheral cannulation and decreasing the need for central venous access devices. They are widely used for delivering IV fluids, antibiotics, and blood products across inpatient and outpatient settings, in both adult and paediatric populations.

Despite their benefits, variation persists in clinical practice regarding optimal tip placement, particularly between axillary and subclavian vein termination. This lack of standardisation creates uncertainty about the safest and most effective tip location and highlights the need for further robust evidence.

Method

A retrospective service evaluation was conducted at Epsom and St Helier University Hospitals NHS Trust for all midline catheters inserted between January 2024 and December 2025. During this 24-month period, a total of 231 MCs were inserted under ultrasound guidance. Catheters were single lumen, 4Fr - 20 cm or 25 cm Smart Midlines (Vygon). Except for one catheter secured with sutures, all devices were secured using the Secur-A-Cath securement system.

Data collected included: patient demographics, confirmation of catheter tip position, dwell time, and reason for device removal.

Table 1: MCs tip location (n:231)

Tip Location	Number (n)	Percentage
Mid-subclavian	212	91.8%
Axillary	7	3.0%
Brachiocephalic	6	2.6%
Distal subclavian	3	1.3%
Proximal subclavian	2	0.9%
Unknown	1	0.4%

Results

A total of 231 midline catheters were inserted during the study period. Tip positioning outcomes are shown in Table 1. Except for one case, all MCs tips termination were confirmed by real-time fluoroscopy or post-insertion X-ray.

The average patient age was 64 years (range: 4-94), and the cohort included 119 male and 112 female patients. 212 MCs were inserted for inpatient treatment and 19 for outpatient therapies.

MCs removal dates for mid-subclavian placement were available for 192 catheters (Table 2). The reason of removal was not known in 10 cases. Twenty patients (9.4%) were lost to follow-up, with no documented catheter removal date, mostly due to a transfer to another hospital with MCs in situ. The average dwell time was 28.6 days. The longest dwell times – 210, 155, and 95 days. The shortest dwell time was 1 day, recorded in five cases.

Table 2: Reason for removal for mid-subclavian tip location (n: 212)

Removal reason	Number (n)	Percentage
Planned removal	130	61.3%
Patient death / End of Life Care	35	16.5%
Accidental or patient-initiated removal	9	4.2%
Suspected infection / treatment escalation	5	2.4%
Another VAD required	1	0.5%
Mechanical complications	2	0.9%
Unknown reason (date of removal known)	10	4.7%
Loss to follow up (date of removal unknown)	20	9.4%

Discussion/Conclusion

Midline catheters intentionally positioned in the mid-subclavian vein demonstrated strong clinical performance for intermediate to long-term IV therapy. The average dwell time was 28.6 days. The three longest dwelling MCs exceeded 90 days indicating stability and durability of placement.

Mechanical complications were rare (0.9%), one MC was removed due to leaking and another due to withdrawal occlusion. Infection-related concerns were similarly low (2.4%). Most catheters (61.3%) were removed after successful completion of therapy, confirming reliable performance across the treatment period. Short dwell times (1 day) were associated with patient death, early discharge, or self-removal, rather than device failure.

Overall, this 24-month service evaluation shows that mid-subclavian midline placement is a safe, reliable, and effective vascular access strategy for both inpatient and outpatient populations. The low complication rates and ability to maintain prolonged dwell times support its use as a robust alternative to other vascular access devices for patients requiring peripherally compatible therapies.

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