

# Improved dialysis adequacy and quality of life from using the Surfacer® Inside-Out® Access Catheter System: a case study

Jo Carter (Haemodialysis Access Specialist Nurse) and James Gilbert (Consultant Transplant & Access Surgeon)  
Oxford Kidney Unit and Transplant Centre, Churchill Hospital, Oxford UK

## INTRODUCTION

Arteriovenous fistula (AVF) is recommended as the “gold standard” for vascular access in dialysis for providing safe and effective dialysis therapy [1]. Sometimes an AVF is not suitable and patients rely on long term dialysis catheters. Central vein pathology is an increasingly common complication in haemodialysis patients when there is a history of central venous catheters (CVC) causing turbulent flows and blood vessel injury [2-3]. Vascular access becomes progressively challenging.

## SURFACER® INSIDE-OUT® ACCESS CATHETER SYSTEM

Surfacer® Inside-Out® Access Catheter System is an innovative approach for acquiring venous access from inside out when standard ways for CVC placement are not appropriate [4]. Benefits include ability to provide reliable and repeatable central access to the right internal jugular vein.

## CASE PRESENTATION

30 year old male presented with a poorly functioning Tesio line.

**Background:** behavioural problems, posed danger to himself and those around him, urea reduction ratio (URR) of 68%.

**PMH :** epilepsy, haemolytic uremic syndrome, bilateral nephrectomies, cardiac arrest 2017-poor left ventricular systolic function due to ischaemic heart disease.

## Vascular Access History between 2012-2017

- 3 Tesio lines
- 4<sup>th</sup> Tesio line exchange on 05/2017 in radiology : difficult procedure; after 4.5hrs left subclavian Tesio inserted
- 10/17 poor flows in 4<sup>th</sup> line patient unwell. MDT -PD, transplant and HeRO® Graft dismissed
- 11/17 insertion of right tunnelled dialysis line using Surfacer® Inside-Out® Access Catheter System

## IMAGING BEFORE PROCEDURE



Figure 1: CT scan SVC calcified, occluded at the level of right innominate scan

## IMAGING DURING PROCEDURE

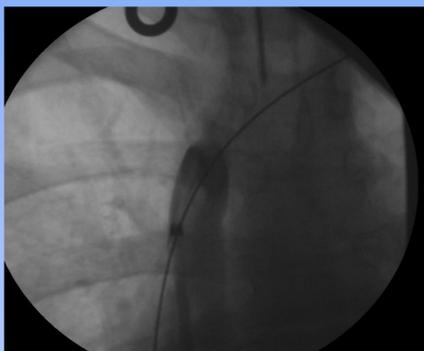


Figure 2: SVC occlusion as demonstrated by table venogram

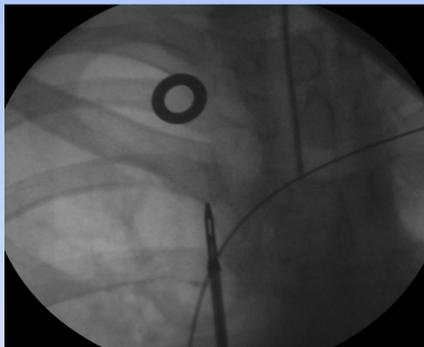


Figure 3: Surfacer inserted through right femoral vein

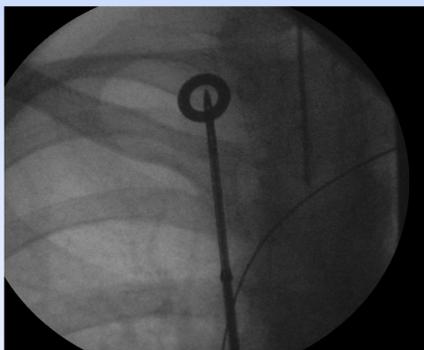


Figure 4: Surfacer and skin marker lined up

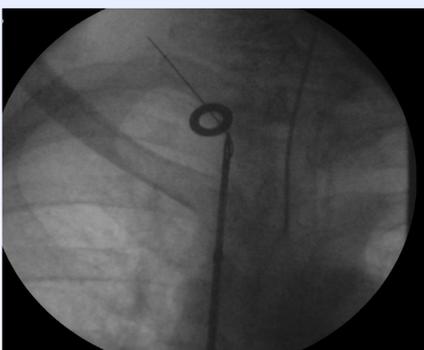


Figure 5: Guide wire deployed

## IMAGING POST PROCEDURE



Figure 6: Permacath in situ

## DISCUSSION

### Outcomes for patient

- New catheter improved dialysis adequacy, the quality of life and increased the appetite, and patient voiced they felt better
- Urea Reduction Ratio improved from 68% in September 2017 to 76% and 84% in October 2017 and March 2018 respectively
- Nurses mentioned the patient was calmer, reduced the strain on carers, and there was long term reliable dialysis access

### Outcomes for nurses

- New catheter easy to use, less risk of infection/clotting as line reversal not required, good blood pump speeds were achieved
- Nurses stated that treatments were free from complications and infection and treatments finished on time

### Outcomes for the organisation

- Treatment more economical; Actilyse Cathflo® (Alteplase) not required, lines/dialyser changes not required

## CONCLUSION

Surfacer® Inside-Out® Access Catheter System is an innovative and exciting new tool in treatment of complex central vein pathology. It helps to facilitate safe and effective dialysis and provides crucial time for the multi-professional team to discuss and plan future access options. As treatment of comorbidities improves patients are expected to live longer, requiring multiple alternative access. Despite the fact that CVC is not recommended as first or long term access option it has helped patients stay well and enjoy quality of life. We hope to make a difference to many more patients using Surfacer® Inside-Out Access Catheter System.

## REFERENCES

1. Clinical Practice Guidelines. Vascular Access for Haemodialysis. Renal Association guidelines, 2015.
2. Agarwal AK, Patel BM, Haddad NJ. Central vein stenosis: a nephrologist's perspective. Semin Dial. 2007;20(1):53-62.
3. Forauer AR, Theoharis C. Histologic changes in the human vein wall adjacent to indwelling central venous catheters. J Vasc Interv Radiol. 2003;14 Pt 1):1163
4. Surfacer® Inside-Out® Access Catheter System, Bluegrass Vascular Technologies, Inc.

## ACKNOWLEDGEMENTS

To the patient described in this case study and to the staff at Milton Keynes Renal unit.  
Sheera Sutherland - Haemodialysis Research Nurse  
Juniya John - Haemodialysis Access Specialist Nurse  
Sarah Dixon - Haemodialysis Access Specialist Nurse