

# Case Study: Buttonhole Cannulation Technique with Keloid-Scarred Skin

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## INTRODUCTION

Buttonhole cannulation technique is recommended and is the preferred approach for the home hemodialysis patient with arteriovenous fistulae (AVF). Keloid formation from previous access techniques may preclude buttonhole cannulation, however, because the associated exuberant scar tissue may cause stenosis to the buttonhole site it may interfere with the tunnel.

Although keloid formation occurs in all racial groups, African Americans and Hispanic are particularly at risk.

Among all DaVita home hemodialysis patients, over half use the buttonhole cannulation technique.

As of December, 2008:

- 1602 patients on home hemodialysis
- 71.5% patients with AVF
- 56% of those AVF patients use buttonhole

This case study focuses on one home patient and shows how buttonhole cannulation can be successful despite keloid formation.



Figure 1: Extensive Keloid

## PATIENT MEDICAL HISTORY

- 37 year-old African-American female on six days-a-week home hemodialysis.
- History includes hemodialysis for 15 years
- Prior to use of buttonhole cannulation required angioplasty every 4-6 months.
- In the current AVF, extensive keloid formed over a three-year period (Figure 1). AVF was assessed for optimal primary and secondary buttonhole sites.
- Patient was taught to self-cannulate and monitor arterial and venous pressure during home hemodialysis. New difficulty in cannulation, decline in Kt/V, or increase in venous pressures prompted a search for new buttonhole sites.



Figure 2: New Buttonhole Sites



## STUDY RESULTS

The results include observations of buttonhole self-cannulation after one year.

When cannulation became difficult or increase in venous pressure was noted, angioplasty revealed 60-70% stenosis of the internal diameter of the fistula.

New buttonhole sites were successfully created on the venous end of the fistula multiple times over the period of a year (Figure 2).

## CONCLUSION

This case study demonstrates that keloid formation does not necessarily preclude buttonhole cannulation. Thus, patients prone to keloid formation can be afforded the full range of benefits of this technique in frequent home hemodialysis.

Use of the buttonhole technique is easily learned, preserves the fistula, causes less pain, and decreases the risk of infiltration. Creation of back-up buttonhole sites is recommended to decrease need for unexpected use of sharp needles.

## KEY POINTS

- Every patient with a fistula should be assessed for possible training in the use of buttonhole cannulation.
- Buttonhole site may be abandoned if placement of a blunt, rather than sharp, needle becomes too difficult or painful.
- It takes more pressure to insert the blunt needle into the track with higher fluid gains (i.e., usually after a skip day).
- Scab removal is crucial and using a tourniquet is a must
- Patient education in fistula examination, assessment of venous and arterial pressures, and when to abandon a site and start a new one is critical to buttonhole success.

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