

Liposuction For Superficialization Of A Deep Hemodialysis Arteriovenous Fistula: A Case Report

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Abstract

Excessive depth of an arteriovenous fistula (AVF) can make needling difficult during hemodialysis. We report the case of a 56-year-old female patient with chronic renal failure, presenting a deep left humero-basilic fistula located 1.21 cm beneath the skin, making cannulation difficult.

Under tumescent local anesthesia, ultrasound-guided liposuction was performed, removing 200 cc of adipose tissue along the anterior and lateral aspects of the fistula. Two-week ultrasound follow-up showed a significant reduction in depth to 0.44 cm.

This minimally invasive procedure enabled easy needling without complications. Liposuction represents a safe and effective alternative for superficializing deep fistulas.

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I. Introduction

The autologous arteriovenous fistula is considered the optimal vascular access for chronic hemodialysis due to its longevity and low rate of infectious complications compared to other modalities (catheters, grafts). However, excessive depth of the fistula relative to the skin surface—often secondary to a thick adipose panniculus—can limit the possibility of effective vascular access. This phenomenon is particularly common in obese patients or those who have gained weight after fistula creation.

Traditionally, fistula superficialization relies on invasive surgical techniques such as vein transposition or extensive dissection, which carry risks of infection, prolonged postoperative pain, and difficult wound healing. Over the past decade, tumescent ultrasound-guided liposuction has emerged as an innovative option to reduce the distance between the fistula and the skin while preserving vascular integrity. This method enables modification of the overlying adipose volume without direct intervention on the vein, thereby reducing operative morbidity.

Clinical Case

A 56-year-old female patient with end-stage chronic renal failure underwent creation of a left humero-basilic fistula six months earlier. Despite good patency and adequate flow, Doppler ultrasound showed a subcutaneous depth of 1.21 cm, making needling difficult and limiting dialysis efficiency. After multidisciplinary discussion, a decision was made to perform liposuction to superficialize the fistula.

Surgical Technique

The procedure was performed under tumescent local anesthesia. The tumescent solution infiltrated around and along the fistula consisted of Klein's solution, providing a vasoconstrictive effect that reduced bleeding. Liposuction was carried out along the anterior and both lateral aspects of the fistula under continuous ultrasound guidance, ensuring constant preservation of venous integrity and hemodynamic flow. A total of 200 cc of adipose tissue was removed. The selective and precise nature of the liposuction allowed for uniform reduction of the adipose panniculus, facilitating superficialization. No intraoperative complications or significant hematoma were observed.

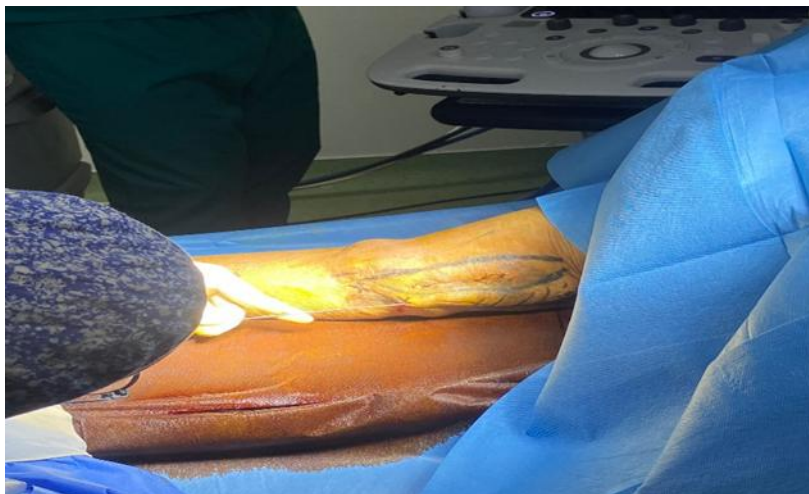


FIGURE 1: Marking of the vein to be superficialized



FIGURE 2: Anesthésie tumescente le long de la veine

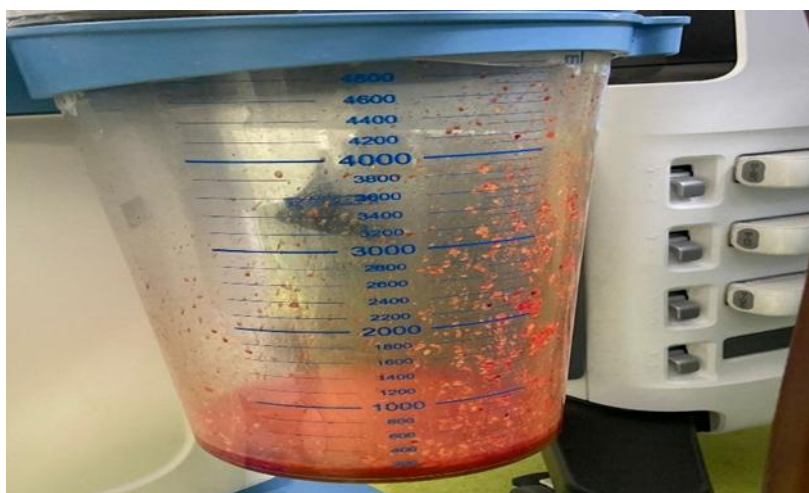


FIGURE 3: Fat removed after liposuction

II. Results

Two-week ultrasound follow-up demonstrated a major reduction in fistula depth, from 1.21 cm to 0.44 cm, well below the optimal threshold for easy cannulation (less than 0.6 cm). Palpation of the thrill remained distinct, indicating good vascular flow. The fistula was successfully and painlessly cannulated by the fourth week, with good short-term tolerance and no signs of infection or thrombosis.



FIGURE 4: Depth of the basilic vein relative to the skin



FIGURE 5: Result after liposuction

III. Discussion

Ultrasound-guided tumescent liposuction represents a significant advancement in the management of deep arteriovenous fistulas. This technique effectively addresses two major issues: the risk of complications associated with traditional open surgeries and the functional limitations of excessively deep fistulas[1]

Studies by Rajput et al. (2022) and Florescu et al. (2024) have shown that liposuction provides a marked average reduction in fistula depth (14–17 mm), enabling earlier and easier cannulation with very low complication rates[1] [2].

Our case aligns with these findings, demonstrating an even greater reduction to 0.44 cm after two weeks, likely related to the substantial amount of fat removed (200 cc) and the meticulous technique employed.

This approach offers several advantages: a reduction in morbidity with fewer incisions, less postoperative pain, and no extensive scars; preservation of vascular flow through ultrasound guidance that avoids trauma; and rapid functional recovery, allowing the initiation of cannulation a few weeks after the procedure, thereby shortening downtime [1].

However, certain limitations must be emphasized: patient selection is crucial, as liposuction is particularly suitable for patients with significant adipose tissue but does not correct stenosis or thrombosis issues; the procedure requires technical expertise and a surgical environment with ultrasound proficiency; and long-term follow-up data remain limited, preventing full assessment of the durability of the achieved superficialization [2].

Looking forward, prospective multicenter studies are needed to standardize tumescent anesthesia protocols, determine the optimal liposuction volumes, and better define eligibility criteria for suitable patients.

IV. Conclusion

Ultrasound-guided tumescent liposuction is a promising minimally invasive technique for superficializing deep arteriovenous fistulas, combining both efficacy and safety. In our patient, removal of 200 cc of adipose tissue led to a significant reduction in fistula depth, facilitating cannulation and optimal use of the vascular access without complications. This method should now be considered a preferred alternative before opting for more invasive procedures.

References

- [1]. Florescu MC, Et Al. Liposuction For Superficialization Of Deep Hemodialysis Vascular Access: A Novel Application. *Plast Reconstr Surg Glob Open.* 2024;12:E5421.
- [2]. Rajput S, Et Al. Liposuction To Improve Vascular Access In Hemodialysis Patients With Arteriovenous Fistulas. *J Vasc Surg Cases Innov Tech.* 2022;8(4):719-725.