شبكة المعلومات الجامعية

التوثيق الإلكتروني والميكروفيلم

# بسم الله الرحمن الرحيم


HANAA ALY

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# جامعة عين شمس

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# قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات

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تحفظ هذه الأقراص المدمجة بعيدا عن الغبار

HANAA ALY

# One-Stage vs Two-Stage Brachiobasilic Arteriovenous Fistula with Superficialization of the Basilic Vein Regarding Patency and Failure Rates

*A thesis submitted in partial fulfillment*
*of the requirements for the master's degree in*
***general surgery***

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| Abb. | Full meaning |
|---|---|
| ***AVF*** | Arteriovenous fistula |
| ***AVG*** | Arteriovenous graft |
| ***BBAVF*** | Brachiobasilic arteriovenous fistula |
| ***CE-MRA*** | Contrast-enhanced magnetic resonance angiography |
| ***CKD*** | Chronic kidney disease |
| ***CVOD*** | Central venous occlusive disease |
| ***CTA*** | Computed tomography angiography |
| ***CVC*** | Central venous catheter |
| ***ESRD*** | End-stage renal disease |
| ***HD*** | Hemodialysis |
| ***IMN*** | Ischemic monomelic neuropathy |
| ***NKF KDOQI*** | National Kidney Foundation's<br>Kidney Disease Outcomes Quality Initiative |
| ***NSF*** | Nephrogenic systemic fibrosis |
| ***PTFE*** | Polytetrafluoroethylene |
| ***PSV*** | Peak systolic velocity |
| ***SD*** | Standard deviation |
| ***SVC*** | Superior vena cava |
| ***VA*** | Vascular access |

# Introduction

Safe, reliable, and durable vascular access is essential for successful hemodialysis. Long term patency rates demonstrate that native arteriovenous fistulas (AVFs) have the best outcome compared to other methods e.g., synthetic grafts and double lumen catheter. Autogenous AVF also has lowest cost and lowest infection rate. [1][2][3]

The patency rate of AVFs in most parts of the world is 60-70% in first year and 50-60% in second year. The primary failure rate of an AVF ranges between 50-54% during the first six months. [4][5]

Ineffective AVF and its complicatios are among the most important problems of chronic kidney disease (CKD) patients. Some of the complications are thrombosis, infection, stenosis, aneurysm formation and distal limb ischemia. [6]

The decision of where to create the AVF can be helped by preoperative vascular mapping using ultrasound imaging which is expected to improve chances of creating an AVF that will likely mature into a useful dialysis vascular access. [7][8]

Dagher was the first to describe the use of basilic vein to create an AVF in the upper arm between the end of the basilic vein and the side of the brachial artery to act as access for long term hemodialysis. Since then, the procedure has seen several changes and modifications. [9]

The superficialization of the brachiobasilic AVF (BBAVF) can be achieved by one of two methods: (1) transposition technique where the entire length of basilic vein is mobilized and positioned anterolaterally under a subcutaneous flap or (2) the elevation technique, where the vein is elevated superficially without mobilization to the surgically created flap between the deep fascia and subcutaneous tissue in the arm. [10]

Currently, there are two usual methods of BBAVF creation: a one-stage or a two-stage operation. The one-stage procedure first creates an anastomosis between the basilic vein and the brachial artery, followed by either elevation or transposition of the basilic vein in one procedure. As a single procedure, one assumes a reduced risk of infection, as well as a decreased anesthetic risk. It is, however, an extensive dissection, which exposes patients with immature fistula to a bigger operation. [10]

In contrast, a two-stage procedure allows for the maturation of the basilic vein first. This process results in the basilic vein being more easily palpable, less liable to damage, and easier to be superficialized. This procedure does, however, increase costs and may result in increased infection and anesthetic risk because it exposes the patient to two procedures. [10]

Furthermore, the second procedure of fistula elevation is performed with the assumption that the fistula has matured; however, this assumption is flawed because the only method to determine its maturity is via cannulation. [10]

All the mentioned outcome definitions were in accordance with the Society for Vascular Surgery reporting guidelines and the North American Vascular Access Consortium guidelines. [11][12]

Primary fistula failure is defined as immediate failure of the BBAVF within 72 hours of surgery, early or late dialysis suitability failure.

Primary patency is defined as the interval from the time of access creation to the first thrombosis occurring at access site, or any intervention to restore blood flow.

Secondary patency is defined as the time from access creation until access abandonment and includes any interventional procedures to restore patency. [11][12][13]

A useful rule to define clinical maturation proposed by the National Kidney Foundation's Kidney Disease Outcomes Quality Initiative (NKF KDOQI) clinical practice guidelines for vascular access is the "rule of sixes," which says that a mature fistula should achieve a blood flow of at least 600 ml/min, a diameter of at least 6 mm, and a depth of 6 mm or less from the surface of the skin and this can be done by duplex. [14]