Endovascular salvage of Failing Arterial grafts

Thesis

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بسم الله الرحمن الرحيم

قالوا سبحانك لا علم لنا الا ما علمتنا انك انت العليم الحكيم

صدق الله العظيم

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ENDOVASCULAR SALVAGE OF FAILING ARTERIAL GRAFTS

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List of appreviations

APP.	Title

- **PTA……**Percutaneous transluminal balloon angioplasty.
- **BPG……**Bypass grafts.
- **PSV……**Peak systolic velocity.
- **CT……**Clotting time.

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introduction

Arterial bypass grafts(BPG) had been used for many decades in Patients with the most severe manifestations of lower extremity arterial occlusive disease for limb salvage and preservation of function. Although good quality bypass offers a good chance for revascularization , but 5-year failure rates are 30-50% and have remained largely unchanged for the past two decades, and the majority of these failures occur within the first year of implantation**, (Owens CD, 2008).**

These postoperative graft failures , especially in the first days and months after surgery,represents a signal of failure for both the patient and the vascular surgeon.At 1 year after failure of infragenicular bypass grafts, more than 50% of patients may suffer major ambutations . Among the remaining patients , 25% suffer from rest pain or ulceration, **(Watson HR et al,2001).**

There are many complications of arterial grafting procedures and these complications may include bleedig(hematoma),infection,fistula formation, pseudoaneurysm development and clot formation(graft

thrombosis),and so, If the revascularization procedure is unsuccessful and ischemia is severe, amputation may be necessary, **(Vincent L et al ,2004).**

Among these complications,and one of the ways that bypass grafts can fail and one of the most serious problem facing the procedure of arterial grafting is graft thrombosis which represents more than 45% of these complications, **(Goldstone J,2002).**

Graft thrombosis is most commonly caused by a reduction in the graft blood flow. As blood flows through a bypass graft, a minimum velocity of flow must be maintained or thrombosis will occur. Within the first 30 days of surgery, poor grafts blood flow leading to thrombosis usually occurs as a result of mechanical defects due to technical errors in the construction of the bypass, improper patient or procedure selection, or use of a poor-quality, small-caliber, or severely damaged vein conduit. Occasionally grafts fail in the early postoperative period without an identifiable mechanical defect or cause and that may be explained by presence of previously undiagnosed hyper-coagulability disorder. Problems leading to graft failure between 30 days and 2 years are usually due to stenotic flow-restricting lesions from intimal hyperplasia. Beyond 2 years, graft

thrombosis is most likely due to stenotic lesions from progression of atherosclerosis in the inflow or outflow bed beyond the graft, **(Donaldson MC et al , 2003).**

These causes of graft thrombosis are myriad and involve both patient factors and technical issues that present themselves throughout the revascularization process from initial presentation through follow-up. At present, technical errors are responsible for 4% to 25% of failures early after revascularization, **(Walsh DB, Zwolak RM et al ,2005).**

So,before mastering the endovascular techniques in management of graft thrombosis,many traditional approaches had been used as open surgical thrombectomy and thrombolytic therapy for treatment of these failing arterial grafts, **(Sultan S,2005).**

Now,The explosive growth in endovascular technologies over the past two decades provides a multitude of therapeutic options to patients with vascular disease and for patients with failing complicated arterial grafts**, (Karch LA ,Henretta JB et al,2000).** once surgeons began performing these endovascular procedures, And because of these endovascular therapies have evolved over the past

several decades ,a change in attitude toward angioplasty resulted in an "endovascular explosion" and an overall reassessment of the traditional approaches to limb ischemia and to the faliure of arterial bypass grafts, and it becomes viable alternative approaches to surgical revascularization **, (Kim JK , Kang HK, 2002), (Taylor SM, 2008).**

Taking in consideration that redo bypass operations are often difficult due to the lack of conduit, adequate target, or increased surgical risk, and resultant limb salvage rates are reduced significantly compared with the index operation.But, endovascular treatment of patients with previously failed bypass grafts results in a high rate of limb salvage. This is a reasonable option in selected patients and the primary choice in those with poor targets, conduit, or excess surgical risk. Endovascular salvage should be considered before proceeding to primary amputation, **(Simosa HF, 2009).**

Nowadays, The target for performance of an endovascular intervention is to replace a complicated ,high-risk surgical procedure with a minimally invasive one having an acceptable patency and clinical success . particularly in patients with significant or prohibitive medical co-morbidities**.** Specially that ,The endoluminal

repair seems to be a promising alternative to redo operations for postsurgical failing arterial grafts, **(Gawenda M et al, 2005), (Nice C,Timmons G et al 2003).**

So ,endovascular management including percutaneous transluminal angioplasty(PTA) and subintimal angioplasty is now being considered as a primary alternative in failing arterial grafts with limb ischaemia with a decreasing number of major amputations (above the ankle) performed **, (Markose G et al, 2008).**

This advent of endovascular surgery has transformed the landscape of vascular disease management and gives a good early and late outcome in this series of patients with a limited life expectancy,and offers a good alternative therapy to redo bypass or surgical graft revision for failure of arterial bypass grafts**.** and these results are comparable to historical results of surgical revascularization in the treatment of failure of arterial bypass grafts(BPG)**, (Tartari S, Zattoni L, 2004), (Costanza MJ et al ,2004).**

Aim of the work

The objective of this study is to determine and to evaluate the efficacy and safety of endovascular procedures in salvage of failing arterial grafts and to demonstrate the feasibility of these endovascular procedures in treatment of failing peripheral arterial bypass grafts(BPG).

Review of ilterature

In 1762 , The first recorded vascular reconstruction was reported by Lambert , When he closed a small opening in a brachial artery . Before that ,vascular ligation was the only vascular procedure practiced.By 1882, Schede had accomplished the first successful lateral vein repair. But the first direct vascular anastomosis probably was Nicolai Eck's lateral anastomosis , In 1877. Then in 1899, Kummell performed the first end to end anastomosis of an artery. The following decades at the beginning of the 20th century witnessed numerous experimental studies. Until Carrel and Guthrie established the principles and techniques of the modern vascular anastomosis and they were the first to achieve significant success with fresh and preserved homografts and heterografts for vascular replacement and bypass. After that, 40 years of delay for these principles and techniques. Till, 1950 when the final launching of the "golden era" of vascular surgery had begun**,(Carrel A, 1907) , (Guthrie CG, 1907).**

After the launching of golden era of vascular surgery, Arterial bypass grafts(BPG) had been used for many years for treatment of critical limb