بسم الله الرحمن الرحيم

MONA MAGHRABY

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

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The Assessment of Postoperative Patency and Flow Pattern of Twisted Vascular Pedicle in Propeller Perforator Flaps in Lower Extremities Reconstruction

Thesis

Submitted for Partial Fulfillment of Master Degree in

Plastic, Burn and Craniomaxillofacial Surgery

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Mohamed Lotfy Hamed Ali

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List of Abbreviations

Abb.	Full term
ALT	*Anterolateral Thigh*
ATA	*Anterior Tibial Artery*
CTA	*Computerized Tomography and Geography*
DGA	*Descending Genicular Artery*
DIEP	*Deep Inferior Epigastric Artery Perforator*
GHS	*Ganga Hospital Score*
HFS-97	*Hannover Fracture Scale-97*
LSI	*Limb Salvage Index*
MESS	*Mangled Extremity Severity Score*
NISSSA	*Nerve Injury, Ischemia, Soft Tissue Injury, Skeletal Injury, Shock and Age of Patient*
PA	*Peroneal Artery*
PSI	*Predictive Salvage Index*
PTA	*Posterior Tibial Artery*
SSA	*Superficial Sural Artery*

INTRODUCTION

Perforator flaps represent the latest descendant in the evolution that began with the random pattern flaps, musculocutaneous and fasciocutaneous flaps. The era of the perforator flaps began in ***1989*** when ***Koshima and Soeda*** described an inferior epigastric artery skin flap without the rectus muscle for the reconstruction of floor of mouth and groin defects noting that a large flap without muscle could survive on a single perforator.

The mere advantage of perforator flaps is that they combine the reliability of their blood supply with reduction of donor site morbidity while conserving muscle and preserving source vessel. The propeller perforator flap is a variant in which complete skeletonization of the perforator with venae commitantes is done to transfer the islanded flap on its pedicle only ***(Hyakusoku, 1991; Hallock, 2006).*** The high tailoring capability provide freedom of pedicle orientation and rotation up to 180 degrees ***(Hou et al., 2015).***

Survival of the transferred vascularized tissue in the immediate postoperative period depends only on the patency of its vascular pedicle, If rapid neovascularization that provide sufficient perfusion of the flap occurs, loss or occlusion of the pedicle may not cause tissue loss ***(Wise et al., 2011; Jakubietz et al., 2017).*** Complete tissue survival despite loss of the vascular pedicle as early as 6-9 days postoperatively has been reported ***(Granzow et al., 2015).***

The relevance of a patent vascular pedicle of perforator flaps varies according to the flap type and the recipient site. Generally, in the free perforator flaps the anastomosed pedicle remains patent and provides most of the blood supply up to 8 years postoperatively ***(Machens et al., 1998).*** Thus, the alteration of the vessel by performing a microsurgical anastomosis doesn't induce architectural changes in the vessel wall leading to gradual obliteration. Flap loss after transection of the pedicle 8 years postoperatively has been reported ***(Salgado et al., 2002).***

In the pedicled propeller perforator flaps that are mobilized solely on a twisted pedicle, twisting of the vascular pedicle may induce remodeling and thickening of the vessel wall leading to gradual occlusion of the vascular pedicle that will be reflected on the flow pattern within the pedicle. The critical time after which the flap became independent on the pedicle due to sufficient perfusion subdermally and from the wound bed is still a matter of debate and uncertainty ***(Teo, 2010; Yoon and Jones, 2016).***

As the propeller flaps became widely used in reconstruction especially in the extremities where there is a limited local tissue available for reconstruction ***(Helmy et al., 1990; El-Saadi et al., 1991; Georgescu, 2012; Ramesha, 2014; Mendieta et al., 2018).*** The possibility of performing secondary procedures such as flap debulking, bone grafting and tendon transfer in many occasions necessitates re-elevation of the flap. This may impair the flap perfusion causing tissue loss. Therefore knowledge regarding the true necessity to guard the pedicle is of vast importance.

Aim of the Work

The aim of this study is to assess the postoperative patency and flow pattern in twisted vascular pedicle of propeller perforator flaps used in lower extremity reconstruction.