ASSESSMENT OF TECHNICAL SUCCESS OF INFRAINGUINAL ANGIOPLASTY USING DUPLEX SCANNING

Thesis

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Abstract

Lower limb arterial angioplasty is now considered the corner stone in management of patients suffering from lower limb ischemia.

Objective:

The aim in this study is to assess the technical success of the infrainguinal lower limb arterial angioplasty using duplex scanning.

Methods:

This study included 20 patients (55% males and 45% females) aged 51 - 73 years (mean 62.95 +/- 5.41 SD). All are diabetic, 65% hypertensive, 45% cardiac, 15% with cerebrovascular stroke and 50% smokers.

All patients were symptomatizing; 6 with claudication, 2 with rest pain, 12 with ischemic non healing ulcers. All patients had pre interventional duplex

All the patients underwent an infrainguinal angioplasty, eight patients had a femro-popliteal lesion, two had tibial vessel disease and ten patients had a multilevel (femro-popliteal and tibial disease).

Statistical methods

Data were coded and entered using the statistical package SPSS (Statistical Package for the Social Sciences) version 23. Data was summarized using mean, standard deviation, median, minimum and maximum in quantitative data and using frequency (count) and relative frequency (percentage) for categorical data. For comparison of serial measurements within each patient (pre and post) the non-parametric Wilcoxon signed rank test was used ***(Chan, 2003a)***.

For comparing categorical data, Chi square ($\chi 2$) test was performed. Exact test was used instead when the expected frequency is less than 5 ***(Chan, 2003b)***. P-values less than 0.05 were considered as statistically significant.

Results:

The overall complete technical success was 95% (19/20 cases). Partial success was found in one case.

The lower limb arterial angioplasty was found to be efficient in treatment of lower limb ischemia apart from some complications such as distant thrombo-embolism, dissection and puncture site hematoma.

Doppler ultrasound was found to be efficient in diagnosing and follow-up of patients with lower limb ischemia.

Conclusion:

Lower limb arterial angioplasty is considered the cornerstone in management of patients suffering from lower limb ischemia.

Duplex scanning considered the imaging modality of choice for detection and follow up of patients suffering from lower limb ischemia as it is inexpensive, radiation-free and provides both anatomic and hemodynamic information about the lesion.

Key words:

Peripheral arterial disease, lower limb arterial angioplasty, duplex scanning.

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List of Abbreviations

ABI	Ankle brachial pressure index
APSV	Ankle peak systolic velocity
ATA	Anterior tibial artery
CFA	Common femoral artery
CLI	Critical limb ischemia
CRI	Chronic renal impairment
CT	Computed tomography
CTA	Computed tomography angiography
DSA	Digital subtraction angiography
FFR	Fractional flow reserve
Fr	French
GW	Guide wire
IC	Intermittent claudication
IVUS	Intravascular ultrasound
MHz	Mega Hertz
MR	Magnetic resonance
MRA	Magnetic resonance angiography
PAD	Peripheral arterial disease
PAVF	Popliteal average volume flow
Pop	Popliteal
PRF	Pulse repetition frequency
PSV	Peak systolic velocity
PSVR	Peak systolic velocity ratio
PTA	Posterior tibial artery
PTA	Percutaneous transluminal angioplasty
PW	Pulsed wave
SAFARI	Subintimal arterial flossing with antegrade retrograde intervention
SFA	Superficial femoral artery
SSFP	Steady state free percetion
SSFP	Steady state free precession
TASC	Trans-Atlantic Society Consensus
US	Ultrasound

Introduction

Introduction

Peripheral arterial disease (PAD) affects almost 12 % of the general population and is responsible for substantial healthcare costs. PAD primarily results in a decreased functional capacity and deterioration in quality of life and is associated with an increased risk of limb amputation, myocardial infarction, stroke, and death ***(Rooke, et al., 2011).***

Two-thirds to three-fourths of patients initially presenting with intermittent claudication (IC) symptoms will remain stable for several years after the initial diagnosis, whereas the remaining one-third to one-fourth will show progressive disease, but only 1–5 % of the PAD population will eventually undergo amputation. Patients suffering from PAD typically present with symptoms of IC or Critical limb ischemia (CLI) ***(Pentecost et al., 2003).***

Critical limb ischemia (CLI) is a major cause of morbidity and mortality among patients with advanced peripheral artery disease ***(Nehler., et al 2014)***.

Patients with CLI are at high risk of major amputation, ranging from 10–40 % at one year after their diagnosis, with mortality approaching 25 % ***(Abu Dabrh., et al 2015).***

The goals of treatment for patients with CLI (critical limb ischemia) include limb salvage, as well as reduction of major adverse cardiovascular events. In the past decade, endovascular techniques have been increasingly employed for prevention of major amputation among patients with CLI ***(Cassese., et al 2012).***

This endovascular first approach has been accompanied by the development of many new technical approaches for treatment of peripheral arterial disease (PAD) ***(Cassese et al., 2012)***.

Multidisciplinary decision-making for treatment must take into account the patient's clinical symptoms, the anticipated life-expectancy, morphological classification of the femoropopliteal atherosclerosis, anatomical challenges, renal failure, contrast allergy, and the availability of vein conduits ***(Rooke et al., 2011).***

Review of Literature