شبكة المعلومات الجامعية

بسم الله الرحمن الرحيم

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التوثيق الالكتروني والميكروفيلم

شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

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

يجب أن

تحفظ هذه الأقراص المدمجة بعيدا عن الغبار

بعض الوثائق الأصلية تالفة

بالرسالة صفحات لم ترد بالأصل

B 1 ٧٥٠٤

ASSESSMENT OF MYOCARDIAL CIRCULATORY FLOW RESERVE IN HYPERTENSIVE PATIENTS : A CONTRAST ECHOCARDIOGRAPHIC STUDY.

THESIS

Submitted to the Faculty of Medicine , Tanta University in partial fulfillment of M.D. of Cardiovascular diseases.

BY

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Master Degree of Cardiovascular Medicine

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First and Above All ,

Praise to ALLAH

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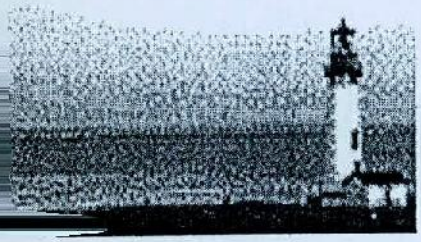
WHOSE HELP AND GUIDANCE WERE IMPERATIVE FOR THIS WORK TO BE POSSIBLE



INTRODUCTION

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Introduction

It has been suggested that the myocardial perfusion can be qualitatively and quantitatively assessed by different ultrasound contrast technique; it has been reported that the intracoronary or intraaortic administration of the ultrasound contrast agents can be used to visualize perfusion defects or to analyze coronary flow reserve.

Intravenous contrast agents are now available for the indication of left ventricular opacification and enhanced endocardial border delineation. The use of contrast enables acquisition of ultrasound images of improved quality .The technique is especially useful in obese patients and with those who have lung disease.

Stress echocardiography can be even more challenging as the image acquisition time factor is critically important for accurate detection of coronary disease.improvement in image quality with intravenous contrast agent can facilitate image acquisition and enhance delineation of regional wall motion abnormalities at peak level of exercise.

The detection of myocardial perfusion during echocardiographic examination will permit the simultaneous assessment of global and regional myocardial sructure, function and perfusion.all of the indicator necessary to enable the optimal noninvasive assessment of coronary artery disease.

Myocardial contrast echography MCE has been a major research objective in cardiovascular ultrasound for almost two decades.

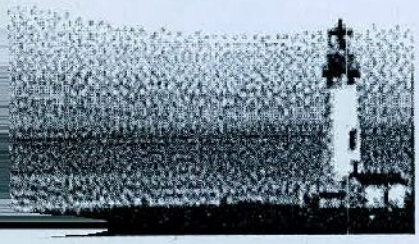
The ultimate goal in MCE is to be able to quantify blood flow in the various segments to determine if adequate oxygenation is achieved.

Ultrasound mediated bubble destruction followed by the measurement of bubble replenishment kinetics opens new perspectives for quantification.

Ultrasound contrast agents have recently developed to improve the signal-to-noise ratio SNR and the signal-to-culture ratio SCR., most of these agents are suspensions of tiny gas bubbles which can be injected intravenously.the bubbles are sufficiently small to traverse the capillary beds without any hemodynamic or physiological effects .

The contrast agent Optison formerly called FS069 is a suspension of albumin microspheres containing the gas perfluropropane is a safe, well tolerated contrast agent with a longer duration of action than albunex(a previously used contrast agent) [236].

Hypertensive patients have alterations of coronary hemodynamics in the form of decreased coronary blood flow and flow reserve with increased coronary vascular resistance and minimal coronary resistance, more recent concepts of endothelial dysfunction are emphasized. (90)



REVIEW OF LITERATURE

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Hypertension and impaired coronary flow reserve

Apart from its effects on stroke, renal failure and peripheral arterial ease, systemic arterial hypertension is a major risk factor for diovascular complications, including coronary artery disease, heart lure and sudden cardiac death [1,2].

ıong the diseases leading to cardiac failure, ischemic heart disease and erial hypertension are most important [3], and myocardial ischemia is a / factor in the development of cardiac failure. In 15-20% of patients with ıically suspected coronary artery disease, however, coronary angiography 'eals coronary arteries of normal anatomical appearance [4]. Arterial pertension is one potential risk factor for the clinical syndrome of angina ctoris, abnormal ECG but nonstenotic coronary arteries [5].

The theory of an inadequate blood supply in hypertrophic heart disease s postulated years ago on the basis of morphologic investigations [6], and ; since been supported by the frequent observation that patients with erial hypertension have an abnormal exercise test or thallium scan even in ; absence of angiographic coronary artery disease [7,8].

us, a clinical observation of signs of myocardial ischemia in the absence stenotic epicardial coronary arteries leads to the assumption of alterations the coronary circulation, non-visible and in -detectable by coronary giography, and requiring a sophisticated approach.

ıysiologic and pathophysiologic considerations

ıysiology of coronary circulation

he coronary circulation is unique because it perfuses the organ that enerates the perfusion pressure for the entire circulation. The major eterminants of coronary blood flow are aortic pressure, extravascular ompression, myocardial metabolism and energy demand, structural chitecture, neuro-humoral and endothelial control of coronary circulation.

Assessing the coronary circulation in hypertension

Systemic arterial hypertension is one of the major risk factors for oronary artery disease, coronary microangiopathy, and left ventricular pertrophy, all of which can potentially lead to cardiac failure and sudden rdiac death. Coronary flow reserve is defined as the maximal increase in oronary flow above its resting, autoregulated level for a given perfusion essure.

arterial hypertension functional and structural alterations are observed at e level of epicardial vessels as well as in resistive vessels requiring ophisticated approaches to assess coronary flow reserve and thus yocardial perfusion. Electrocardiographic tests and echocardiography can e regarded as monitoring and screening methods. Myocardial scintography useful to semiquantitatively estimate hypertension-associated perfusion normalities, whereas positron emission tomography provides the only uantitative approach of anon-invasive technique for myocardial blood flow easurement.

Invasive methods for the assessment of coronary blood flow need ardiac catheterization procedures, such as techniques requiring atheterizationof the coronary sinus, angiographic methods, and guidewire

ısed methods.

ıermodilution and venous oxymetry in the coronary sinus systematically ıderestimate coronary flow reserve and are thus considered as only miquantitative approaches. In contrast, the gas chromatographic argon ethod allows aquantitative measurement of coronary blood flow at seline and during maximum vasodilation; thus it is possible to distinguish tween an altered auto regulated and maximal flow as the major cause of a duced coronary flow reserve and to evaluate long-term therapeutic erventions in hypertensive hearts.

Videodensitometric and angiographic methods should be restricted only to tients with coronary microangiopathy or with coronary single-vessel sease. Guide wire-based Doppler techniques are suitable to semi - antitatively assess coronary flow reserve with a considerable spatial and ne resolution. Myocardial biopsies may gain insight into hypertension-sociated structural alterations in small arterioles. Long-term treatment of pertensive heart disease aims to normalize blood pressure, to reduce left ntricular hypertrophy and to achieve cardio reparation including reversal the abnormal structure and function of coronary circulation.

These factors largely influence the two major physiologic features of the ronary circulation: the phenomenon of autoregulation and the regulation coronary flow reserve.

utoregulation

Autoregulation is defined as the intrinsic tendency of an organ to aintain constant blood flow despite changes in arterial perfusion pressure