Multidetector CT Angiography In Assessment Of Lower Extremity Arterial Occlusive Disease

THESIS

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Introduction and Aim of the work

Peripheral arterial occlusive disease of the lower extremities is not a frequent primary cause of mortality; however, it is an important cause of morbidity and an adverse prognostic indicator among the elderly ***(kannel et al., 2004)***

Peripheral arterial disease (PAD) is a major problem among the population of those 55 years and older ***(Meijer et al., 1998)***

By age 60, approximately 3-6% of men have intermittent claudication related to lower extremity arterial occlusive disease ***(Dormandy et al., 2000)***

Digital subtraction angiography (DSA) has been the standard reference technique for the evaluation of peripheral vascular disease ***(Hideki et al., 2003)***

Catheter- based DSA has remained the standard of reference for the evaluation of peripheral ischemia ***(carlo et al., 2004)***

Digital subtraction angiography (DSA) is currently the imaging technique of choice for assessing PAD of the lower extremities. The adverse effects and associated costs of DSA have led to an intensive search for noninvasive alternatives for imaging the inflow and runoff vessles ***(Thomas Schertler et al., 2005)***

Because the number of revascularization procedures performed to treat PAD is increasing ***(Al-Omran et al., 2003),*** the number of preoperative diagnostic imaging procedures is also increasing ***(De Nederlandse et al., 2002)***

Decision making prior to surgery or percutaneous intervension depends on accurate characterization of the level, multiplicity, and severity of stenoses ***(Malden et al., 1994)***

Computed tomographic (CT) angiography is increasingly used for noninvasive imaging of various vascular territories ***(Jurgen et al., 2005)*** The introduction of multi-detector CT (MDCT) scanners has substantially improved CT angiography by offering increased volume coverage, decreased dose of contrast medium, decreased acquisition time, and improved spatial resolution for assessmet of small arterial branches, including the lower extremity arteries ***(Ota et al., 2004)***

MDCT angiography permits the precise evaluation of the vascular wall itself. It can clearly depict the courses of vessels not only in patent but also in completely occluded segments; the preoperative information concerning the vascular wall, such as the degree of mural calcification and plaques, obtained with MDCT angiography is important in determining the anastomotic sites for bypass grafting. In addition to extravascular causes of occlusion may be detected by MDCT angiography **(Beregi JP et al., 1997)**

AIM OF THE WORK:

The aim of this work is to assess the arterial vascular system of the lower extremities in patients with peripheral arterial occlusive disease using multidetector -CT angiography (MD-CTA) and to compare the results with the standard of reference, intrarterial digital subtraction angiography (IA-DSA).

Referances

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المحتويات

يشمل البحث فحص عدد ثلاثين حالة تعانى من إنسداد شرايين الطرف السفلى بواسطة تصوير الشرايين بالأشعة المقطعية متعددة اللواقط و التصوير الرقمي للشرايين بالصبغه يجرى البحث بمستشفيات جامعة عين شمس ومستشفى عين شمس التخصصى و بعض مراكز الأشعه الخاصه.

المقدمه و الهدف من الرساله

تعتبر أمراض إنسداد شرايين الطرف السفلى من أهم المعوّقات الرئيسية فى كبار السن .

حوالى 3-6 % من الرجال قرابة سن الستين تعانى من ألم العضلات الناتج من إنسداد شرايين الطرف السفلى .

و يعتبر التصوير الرقمي للشرايين بالصبغه هو الفحص المتعارف علية لتقييم هذا المرض, و لكن أثاره الجانبية و تكلفتة الباهظة أدت إلى البحث عن طريقة اخرى للتشخيص بحيث تتماشى مع التقدم الكبير فى وسائل علاج إنسداد الشرايين .

وتصوير الشرايين بواسطة الأشعة المقطعية أصبح وسيله أكثر فعّالية و أماناً و خاصةً بعد إدخال الأشعه المقطعيه متعددة اللواقط التى ساعدت كثيراً في تصوير الشرايين و ذلك لسرعتها الفائقه فى تصوير أجزاء أكبر من الشرايين بإستخدام كميه أقل من الصبغه مع الحفاظ على جودة الصوره و التفاصيل مما ساعد فى تصوير الشرايين الدقيقه بالطرف السفلى ؛ كما تستطيع الأشعه المقطعيه متعددة اللواقط تصوير جدار الاوعيه حتى فى حالات الإنسداد الكامل مما يوفر معلومات كامله عن الاوعيه الدمويه قبل إجراء العمليات الجراحيه .

و الهدف من هذا البحث هو تقييم الشرايين في المرضى الذين يعانون من إنسداد شرايين الطرف السفلى و ذلك بواسطة الأشعه المقطعيه متعددة اللواقط و مقارنة النتائج بالتصوير الرقمي للشرايين بالصبغه .

دور الأشعة المقطعية متعددة اللواقط في تشخيص أمراض إنسداد شرايين الطرف السفلي

رسالة

توطئة للحصول على درجة الدكتوراة
فى اللأشعة التشخيصية

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List of Abbreviations

€	U.S. Dollar
16 D	16 Detector
2 D	Two Dimentional
3D	Three Dimensional
AAA	Abdominal Aortic Aneurysm
ATA	Anterior Tibial Artery
AVF	Arteriovenous Fistula
AVM	Arteriovenous Malformation
CFA	Common Femoral artery
CIA	Common Iliac Artery
CM	Contrast Media
CPR	Curved Planar Reconstruction
CT	Computed Tomography
CTA	Computed Tomography Angiography
DAS	Data Acquisition system
DFA	Deep Femoral artery
DPA	Dorsalis Pedis Artery
DSA	Digital subtraction Angiography
EIA	External Iliac Artery
FOV	Field of View
GI	Gastro-intestinal
HU	Hounsfield Unit
IA-DSA	Intraarterial Digital Subtraction Angiography
KVp	Kilo Volt
L.E.	Egypt Pound
LEPAD	Lower Extremity Peripheral Arterial Disease

mAs	Milliampere Second
MDCTA	Multi-detector Computed Tomography angiography
Mg	Milligram
MIP	Maximum Intensity Projection
Ml	Milliliter
mm	Millimeter
mm	Millimeter
MPR	Multi-Planar Reconstruction
MSCT	Multislice Computed Tomography
mSv	MilliSievart
PAD	Peripheral Arterial Disease
PACS	Picture archiving and communication system
PAOD	Peripheral Arterial Occlusive Disease
POP A	Popliteal Artery
PTA	Posterior Tibial Artery
PAAs	Popliteal Artery Aneurysms
PVD	Peripheral Vascular Disease
S	Second
SAR	Slice Acquisition Rate
SFA	Superficial Femoral aretery
SSCT	Single Slice Computed Tomography
SSD	Surface shaded Display
TAO	Thromboangiitis Obliterans
US	Ultrasound
VR	Volume Rendering
WC	Window Center
WW	Window Width

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