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التوثيق الالكتروني والميكروفيلم

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ROLE OF MAGNETIC RESONANCE IMAGING IN EVALUATION OF ACQUIRED LUMBAR SPINAL CANAL STENOSIS

Thesis

Submitted for Partial fulfillment of Master degree in

"Radiodiagnosis"

By

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ABSTRACT

Introduction: The lumbar spinal canal stenosis is relatively common condition of varied aetiology .The lumbar spinal canal stenosis has been defined as (any type of narrowing of the spinal canal, nerve roots or intervertebral foramena) that putting pressure on the spinal cord or on the roots of these branching nerves causing pressure symptoms in the form of pain, weakness and in some patients causing sphinecter troubles.Different imaging modalities are done for diagnosis,, but the recent and excellent method for diagnosis is MRI of the lumbar spine.**Material and methods:** This study included 58 patients refered from neurology, neurosurgery, orthopedic departments of Tanta university hospital and out patient's clinics. During the period from augest 2005 to october 2006. All patient were applied to full history taking, neurological examination, Plain X-ray in 20 cases, MRI examination for all cases with some measurement done at the level of disc. **Results:** In this study, the degenerative cause for spinal canal stenosis was the common cause which represents 65.5% of the cases and the non-degenerative causes represent 34.5% of the cases, Also MRI gives more diagnostic findings.and grading for the degree of lumbar stenosis.
Conclusion: From this study, the role of MRI in diagnosis of lumbar stenosis is of great value ispite, the MR measurements are of little value. The ability of MRI to differentiate various types of lumbar canal stenosis and its degree and exact site of stenotic segment without hazard of exposure to ionizing radiation.

المستخلص

المقدمة: يعتبر ضيق القناة الشوكية بالفقرات القطنية من الأمراض المتعددة الأسباب التى تؤدى إلى تقلصات وألم أو تنميل بالأطراف السفلية مع فقدان الإحساس فى هذه الأطراف وأحيانا إلى قصور فى وظيفة المثانة والقولون. ويعرف ضيق القناة الشوكية على أنه أى ضيق يحدث فى القناة الشوكية وجذور الأعصاب أو ضيق بالفجوات أو الثقوب الجانبية مما يؤدى إلى حدوث ضغط على هذه الأعصاب وحدوث الأعراض . وقد تعددت وسائل التشخيص لكن الرنين المغناطيسى هو الأداه الذهبيه للتشخيص.**المرضى وطرق البحث:** أجريت هذه الدراسة فى قسم الأشعة التشخيصيه، بمستشفى طنطا الجامعى على ثمانيه وخمسين حاله من أغسطس 2005 إلى أكتوبر 2006 حيث خضع كل المرضى إلى المعرفه الدقيقه للمرض، الفحص الأكلينينى الشامل، الأشعة العادية تم عملها فى عشرين حاله و الفحص بالرنين المغناطيسى لجميع الحالات.**النتائج:** .إتضح من نتائج هذا البحث أن أهم وأكثر الأسباب شيوعيه هى أسباب تحلليه تشمل (تحلل وتفتق الغضاريف ،تضخم الرباط الأصفر والمفاصل ، وجود زوائد عظمية ، انزلاق وانحلال فقارى) وتمثل 65.5% من نسبة الحالات. و الأسباب غير تحلليه فهى أقل شيوعا والتى تشمل (ما بعد الإصابات والعمليات الغضروفية ، الإلتهابات ، الأورام ، مرض باجت والعديد من الأسباب الأخرى) والتى تمثل 34.5% من نسبة الحالات.وإتضحت كفاءة الرنين المغناطيسى كوسيلة جيدة للتشخيص وذلك لتعدد مستوياته فى التصوير وقدرته على تمييز الأنسجة المختلفة.**الأستنتاج:** أن الرنين المغناطيسى يمثل طريقة قيمة للتشخيص بالنسبة لضيق القناه الشوكية حيث يعطى فكرة دقيقة عن مستوى أو مستويات ضيق القناة الشوكية بالفقرات القطنيه وأيضا كفاءة الرنين المغناطيسى ودقته فى تشخيص الأسباب المختلفة لضيق القناة الشوكية إلا أنه غير دقيق فى تحديد الصابات العظمية والتكلسات والحدود الخاصة بالعظام.

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Abbreviations

A-P : **Antero-Posterior**

CT : **Computed Tomography**

DWI : **Diffusion-weighted Imaging**

FSE : **Fast Spin-echo**

ET : ***Echo Time***

FLAIR : **Fast Fluid-Attenuated Inversion Recovery**

FOV : **Field of View**

HNP : **Herniated Nucleus Pulposus**

IR : **Inversion Recovery**

LSS : **Lumbar Spinal Stenosis**

MRI : **Magnetic Resonance Imaging**

NEX : **Number of excitations**

RF : **Radio Frequency**

RT : **Repition Time**

SAP : **Superior Articular Process**

SNR : **Signal to noise ratio**

STIR : **Short-Inversion-Time Inversion Recovery**

CONTENTS

introduction

INTRODUCTION

The lumbar spinal canal stenosis is relatively common condition of varied aetiology which commonly disables and functionally limits the aging population[1].

The lumbar spinal canal stenosis has been defined as (any type of narrowing of the spinal canal, nerve roots or intervertebral foramena) which may be local, segmental or generalized that putting pressure on the spinal cord or on the roots of these branching nerves[1].

This pressure can lead to a wide range of problems : cramping, pain or numbness in legs and back, also loss of sensation in lower extremities and sometimes problems with bladder and or bowel function[1].

Acquired lumbar spinal canal stenosis is the most common cause of spinal canal stenosis which may be classifeid as degenerative changes in the spine caused by aging (disc herniation ,ligamentum flavum and facet hypertrophy, spondylolithesis, spondylotic changes and marginal osteophytes...) and non- degenerative causes which include post-traumatic, post-operative, tumours, infection, iatrogenic, miscellaneous, other rare cuase as paget`s disease and metabolic disease of the bone [2].

The role of imaging techniques in evaluation of patients with symptoms suggestive of lumbar spinal canal stenosis is not only to demonestrate that stenosis is present but also to identify the level and relative contributions from both bony and soft tissue structures, thereby allowing accurate pre-operative planning which is vital for a good surgical outcomes[3].

These imaging techniques include:

1-Plain radiography of the lumbar spine in Antero-posterior, lateral and lateral flexion and extension positions if required to show evidence of multilevel degenerative changes.

2-Myelography is no longer necessary requried as it is an invasive methods, often requiring hospitalization and has many complications inspite of its diagnostic values.

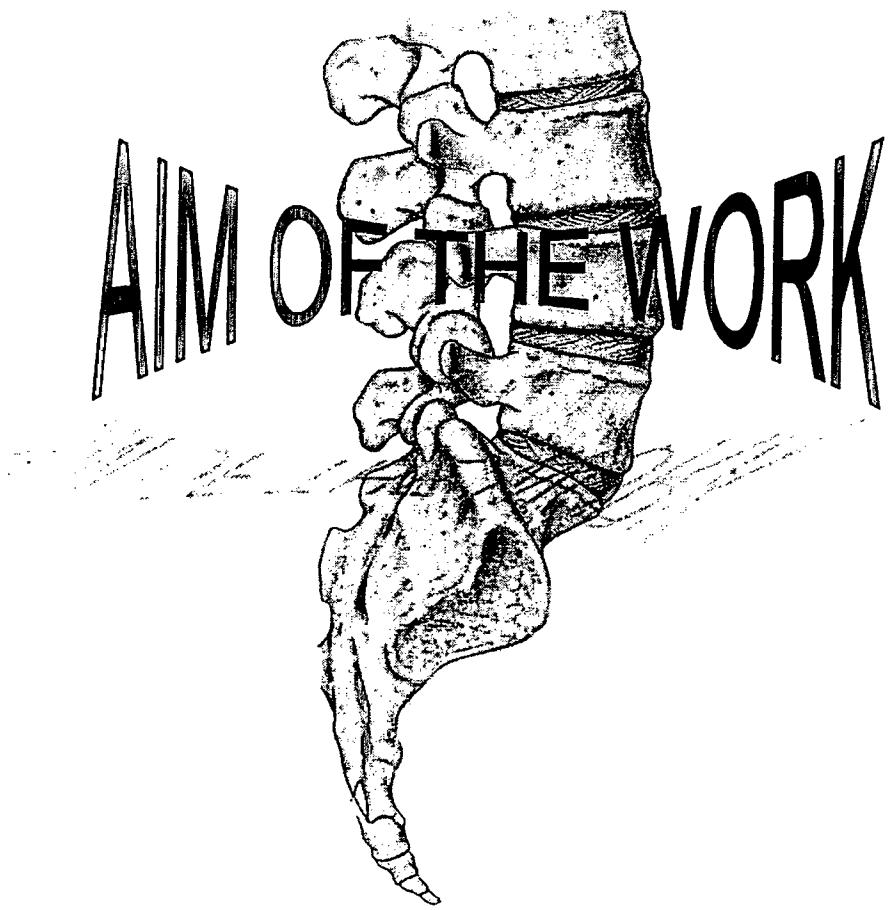
3-Computed tomography is used to determine canal dimensions (in transverse planes) and configurations with excellnt osseous details and less soft tissue details, also it carreis the hazard of ionizing radiation [4,5].

4-Magnetic resonance imaging is considered the first choice and the gold standard in evaluation of spinal canal stenosis as it does not require ionizing radiation with clear differentiation of varies anatomical structures and combines the overview of myelography and the detailed analysis of CT scan[6,7,8,9,10].

- MRI is most useful in evaluating soft tissues and neural structures especially in herniated intervertebral disc and if associated with marrow signal intensity changes[11].
- MRI with contrast enhancementt can evaluate spinal infection with paraspinal or epidural inflammation as it has good to excellent sensitivity[12].
- Also MRI playes an important role is assesment of metastatic spinal cord compression which represent a major cause of morbidity [13].

- Finally MRI offers numerous possibilities for cutting different planes through the investigated object.

AIM OF THE WORK



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