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Role of Magnetic Resonance Imaging in Diagnosis of Causes of Spinal Canal Stenosis at Lumbosacral Spine

By:

Dr.Alyaa Hussein Jawad

M.B.CH.B

Supervised by:

Dr. OSAMAH AYAD ABDULSATTAR

Prof. of Radiology

A thesis submitted to the University of Babylon / College of Medicine as partial fulfillment of requirements for the degree of a high diploma in diagnostic radiology .

Dr .Alyaa Hussein Jawad

M.B.CH.B

Supervisor Certification

We certify that this thesis entitled "Role of Magnetic Resonance Imaging in Diagnosis of Causes of Spinal Canal Stenosis at Lumbosacral Spine" was prepared under our supervision as a partial fulfillment of requirements for the degree of a high diploma in diagnostic radiology

Dr.Osama Ayad Abdulsattar Mashtah

Prof . of Radiology

M.B.CH.B. , F.I.B.M.S (RAD)

D.M.R.D (RAD)

Dr.Amani Alaa Saeed

Lecturer of anesthesiology

M.M.B.CH.B , F.I.B.M.S(Anesthesia)

Examination committee certification

We, the examining committee , after reading this thesis entitled "Role of Magnetic Resonance Imaging in Diagnosis of Causes of Spinal Canal Stenosis at Lumbosacral Spine" and examining the candidate Dr . Alyaa Hussein Jawad in its contents , find that it meets the standard and requirements as a thesis in a partial fulfillment of requirements for the degree of a high diploma in diagnostic radiology.

Dr. Amjaad M. Hameed

Prof .of Radiology

D.M.R.D F.I.B.M.S. R.D

(Chairman)

Dr. Jabir Hassan Obaid Al sanafi Bayati

Consultant radiologist

M.B.CH.B. F.I.B.M.S. (Rad.)

(member)

Dr. Hasanain Ahmed Jasim Al

Prof . of Radiology

M.B.CH.B. F.I.B.M.S (Rad.)

(member)

Dean's certification

I , the Dean of Col ege of Medicine University of Babylon certify that , this thesis "Role of Magnetic Resonance Imaging in Diagnosis of Causes of Spinal Canal Stenosis at Lumbosacral Spine"

was prepared by the candidate Dr . Alyaa Hussein Jawad and submitted to our col ege committee on graduate studies

Prof.

Dr . Mohend A.N. Al- Shalah

The Dean of College of Medicine

University of babylon

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

إِنْ تُبْدُوا خَيْراً أَوْ تُخْفُوهُ أَوْ تَعْفُوا عَنْ سُوء
فَإِن اللّهَ كَانَ عَفُواً قَدِيراً

صدق الله العظيم

سورة النساء

الآية (149)

Dedication

I 'd like to dedicate this research study to my family : for their endless support and encouragement, to finish this work.

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Abstract:-

Background:. Spinal stenosis is an abnormal narrowing of the spinal canal or neural Spinal foramen that results in pressure on the spinal cord or nerve roots. MRI has become the most frequently used study to diagnose spinal stenosis. MRIs are helpful because they show more structures, including nerves, muscles, and ligaments, than seen on X-rays or CT scans.

Aim of the study: to assess the beneficial role of MRI in evaluate and differentiation causes of spinal stenosis at lumbosacral spine.

Patient and method: A cross sectional study was recruited patient lower back pain, it's launched in 1st August 2021 to 1st September 2022, in radiological department of Babylon teaching hospital. Collection of data based on well-defined questionnaire contain three parts. MRI was perform with a 1.5 Tesla systems (Achieva; Philips Medical Systems, the Netherlands) using a SENSE body coil. Data was collected and analyzed using SPSS 23.

Result: The mean age of patients was 49.1±8.3, 55% of them in age group 40-60 years and 45% in age group 20-39 years. Male to female ration was 1.3: 1 the male constituent 56.7% of sample. The MRI findings, the stenosis was presented in 83.3% of patients of them 13.3% was mild stenosis and 70% was moderate stenosis, as in table 3. The spinal level of L4-L5 was the major region of stenosis in 50% of sample whereas the L2-L3 level 16% and L3-L4 26% of patients **.**

Conclusion: MRI modalities a diagnostic option in evaluation of lumbosacral spinal stenosis, as it can describe appropriate variable pathological changes, such as disc degeneration.

List of Abbreviations

MRI	**Magnetic resonance image**
LSS	lumbosacral stenosis
DSCSA	Dural sac cross sectional area
CT scan	computed tomography scan
WI	weight images
SR	stenosis ratio
SPSS	statistical package of social sciences
SD	standard deviation

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CHAPTER ONE

Introduction

Introduction:-

The narrowing of spinal canal or neural foramens called spinal stenosis. These pathological stat may cause increase compression on the spinal cord and some time nerve pathway root[1]. Result in various symptoms and signs such as pain, weakness in arm or leg and numbness in limbs. These clinical features actually grow slowly to intense presentation and its can be improved by bending of trunk ahead. With increase severity result in loss of bladder controll, loss of bowel control and sexual dysfunction[2].

Many causes are reported and investigated for example osteoarthritis, rheumatoid arthritis, tumor in spine, trauma , bone pagets disease, scoliosis, spondylolisthesis and genetic disorder[3].These lesion could categories by region of spine was affected it subdivided into cervical, thoracic and lumbar stenosis.

The most common part affected was lumbar spinal stenosis at lumbar, secondly cervical stenosis , thoracic spine stenosis are less common[4].

Pressure on nerve root at lumbar spine in lower back, might be causes features of sciatica include tingling , weakness and numbness, it radiating from back to buttock and leg[5].

Causes of spinal stenosis [6,7]

1- Aging

Any of the factor further down might cause the space in the spine to be narrowing ,(figure 1-1);

- Spinal ligament can be become thick (*ligamenta flava*) and/or Facet joint might hypertrophied
- Bone spurs developed on the bone and into the spinal canal or foramina orifice.
- Intervertebral disc may bulging or herniated into the canal or foramina opening
- Degenerative disk disease causes contracted of the space.
- Facet joint interruption
- Compressing fracture of the spine, which are common in osteoporosis
- Cyst form on the facet joint producing firmness of the spinal sac of nerve (thecal sac)

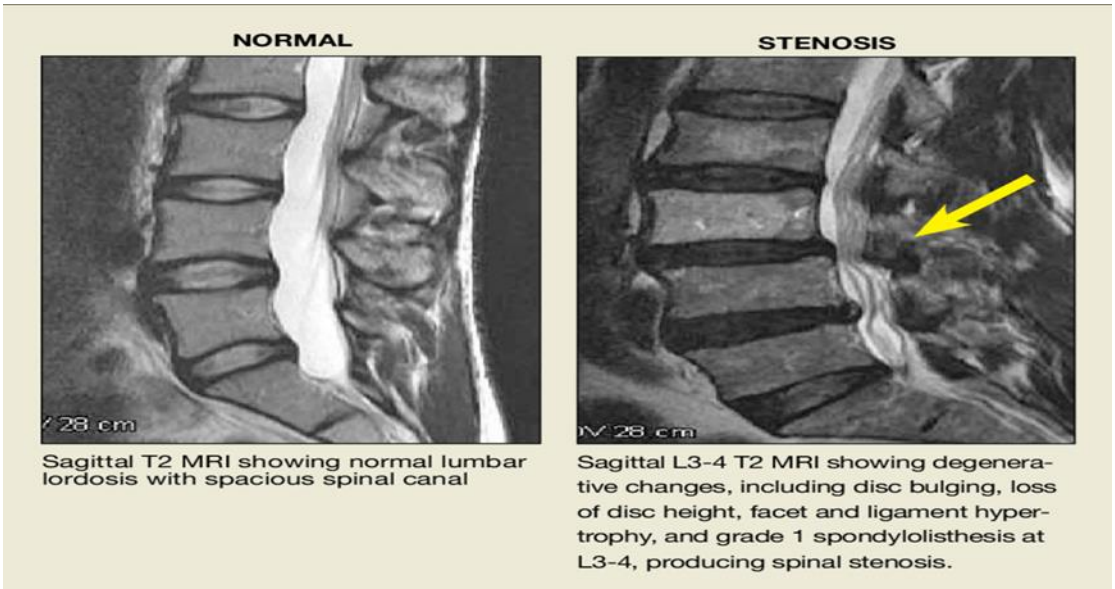

Figure 1-1 MRI of lumbar spinal stenosis (Spondylosis pattern) [8]

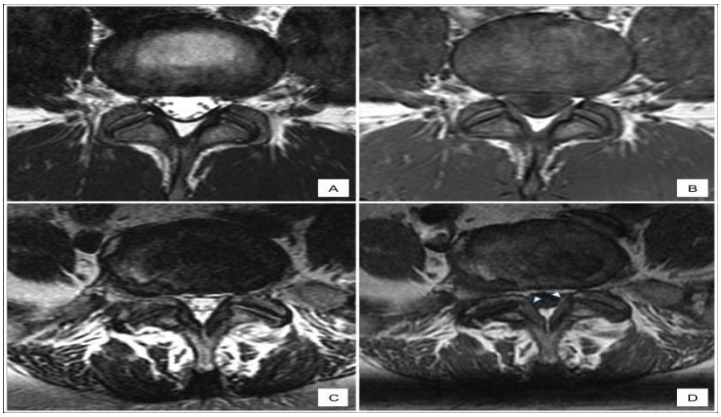

Figure 1-2 Axial T1WI (A, C) and T2WI (B, D). Upper images: normal facet joints and ligamenta flava, central canal and lateral recess. Lower images: facet joints with osteophytes associated with right ligamentum flavum hypertrophy [(9)]

2-Arthritis

- Osteoarthritis
- Rheumatoid arthritis—much less common cause of spinal problems

3-Congenital

- Spinal canal is too small at birth
- Structural deformity of the vertebra may causes narrow of the spinal canal.

4-Instability of the spine

- A vertebra slip onward on another (spondylolisthesis)

5-Trauma

- Accident and injury may dislocate the spine and the spinal canal or causes burst fracture that produce fragment of bone that go through the canal.

6-Tumor

- Unbalanced growth of soft tissues will causes inflammations.
- Growth of tissues into the canal pressing on nerve, the sac of nerve, or the spinal cord.

Diagnosis

To get diagnosis of spinal stenosis included a throw assessment of spine. The procedure frequently start by medical history which is important part of evaluation to know possible causes through symptoms or other diseases and physical examination with radiological investigation such as X ray and magnetic resonance images are routinely used to define the degree and site of nerve root compressions[(1)]. Through detail physical examination the physician can get idea about level of nerve root compression and possible causes with concentrating on region of sensory disorder or abnormal reflex and muscle weakness[(7)].

Common presentation of lumbar spinal stenosis are pain in lumbar back which are arise from many disorders to give a example facet joint arthropathy and muscle strain[(1)].. The pain can happened through direct pressure on nerve root at site of intervertebral disc as herniation, or by inflammatory processes, like by infection which are commonly producing pain through dermatome area[(7)].

Neurogenic claudication frequently due to central canal stenosis of vertebra with variables form, where as the vasogenic it is much constant and repeated[(3)].

Top most thing in defining period of clinical feature and recognize the red flag note in medical history and physical examination [(7)]. Good approach need to distinguished from simple benign cause for example

muscle strain from more danger condition such as abscess in epidural space or secondary metastasis. In addition other risk factors must quantifying likely use of steroid and age of patients or form of stiffness may give suspicion of fractures or ankylosing spondylitis[11].

Magnetic resonance imaging

The most common modalities to investigation the spinal stenosis are MRI, it become popular in diagnosis, by produce electromagnetic signal to show image of spine. It can appear soft tissue clearly such as nerve, muscle and ligament than they show by CT scan or X ray. It aid in find the accurate causes of spinal nerve obstacle[7].

Image qualities of MRI make the diagnosis more comprehensive and complete in path of evaluation of intervertebral disc with neural structure.

MRI have a good reliability criteria, it have high sensitivity but questionable specificity in investigation of lumbar spine disorder, in disc herniation sensitivity range from 80-100% and low specificity range from 45- 90%. These low value are due to large number of asymptomatic disc degenerative which produce high false positive result[10].

MRI have no emit of radiation, it is safe and have good accurate in provide evidence about structures such as vertebral body, spinal canal, spinal cord and others. Common plane in investigation are sagittal and axial with T1 and T2sequence. In some extent contrast will used specially in spinal infection, vascular anomaly post operative complication, tumor and secondary metastasis. Metastasis from prostate cancer are more prevalent seen in lumbar spine, other complication of metastasis such as cord compression could be find by MRI study[11].

There were frequent reason for indication to MRI of spine such as leg pain and back ache.

The finding of MRI images show following signs[12].

- degenerative change, for example disc herniated or annular fissure when the disc broken(figure 1-3).

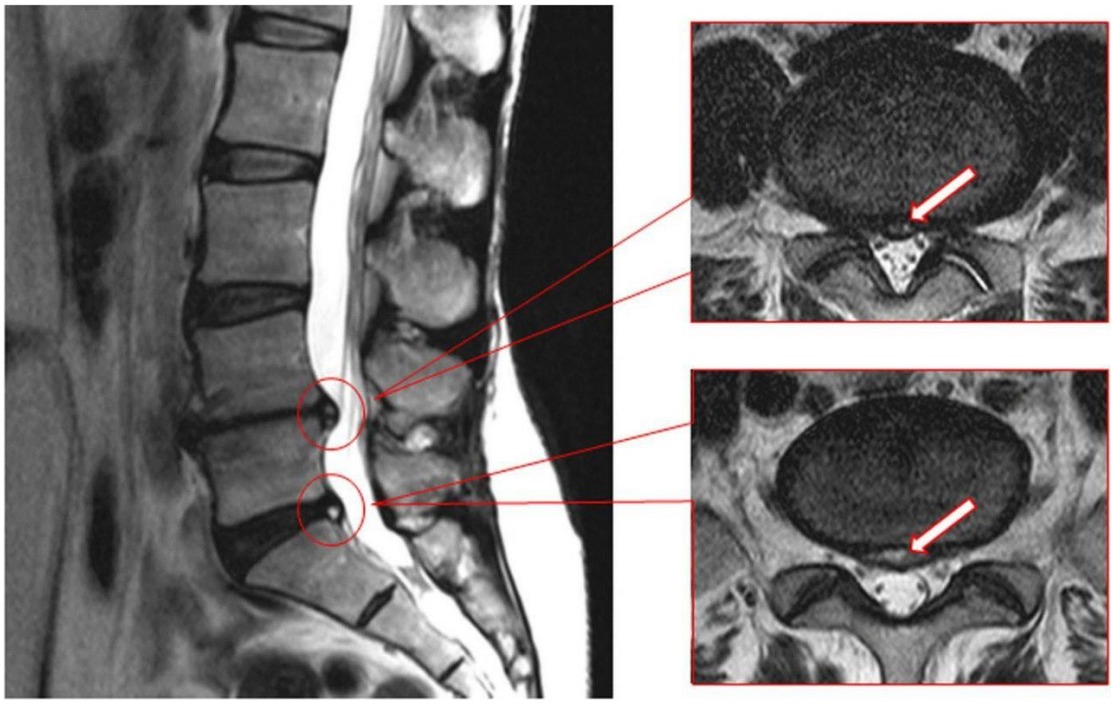

Figure 1-3 Disc bulge and herniations (white arrow) were diagnosed when the annulus was bulged beyond the posterior vertebral border of the disc in sagittal T2 MRI images. Annular tears/ high-intensity zones were defined as focal areas of high signal intensity on axial T2 images near the posterior disc annulus (white arrow).[13]

- inflammations or infections
- tumors of benign and malignant
- stenosis of central canal of spine , lead to reduction in diameter of spinal canal that produce nerve compression.
- ankylosing spondylitis, which yield changing in shape of vertebra with inflammation
- spondylolisthsis, this occur when the vertebra move from it site lead to distorted spinal alignment.
- Another pathology for example abscess.

Aim of study

To assess the beneficial role of MRI in evaluate and differentiation causes of spinal stenosis at lumbosacral spine.

Chapter two

Patients and Methods

Patients and methods

Study designs and siting

A study of cross sectional design was recruited patient lower back pain, it's launched in 1st August 2021 to 1st September 2022in radiological department of Babylon teaching hospital.

Inclusion criteria

1-patients had lower back pain or leg pain

2-age 18- 60 years

3-symptoms last for more than 4 weeks

4- no cancer or inflammation suspicion

Exclusion criteria

1-patients had history of spinal surgery.

2- patients with contraindication to MRI(e.g metallic foreign body)

3-disease that produce intervertebral disk herniation.

4-laboratories results suggestive of presence of coagulopathy, infections, or inflammatory diseases

4-patient whose have not finished questionnaire.

Data collection

Collection of data based on well-defined questionnaire contain three parts, demographics criteria, detail of present illness and results of procedures. First of all, a oral agreement was obtained from patient to enrolled in the study. Patient's demography contains age, sex and occupation.

Patients enrolled in study with clinical features of claudication, pain in leg and back pain, numbness lower limb in both or one and radiological study of spine.

Recruited patients give appointment for MRI investigation, short and brief clarification about examination and summary of contraindication, general advisement to noise and time of examination and cloth they wear, some patients afraid from narrow space we tell him about communication with examiner through intercom tool.

MRI examination technique

MRI was perform with a 1.5 Tesla systems (Achieva; Philips Medical System, the Netherland) by use a SENSE body coils.

Assessment procedure through measurement of dural sac cross sectional area (DSCSA), level of stenosis and if seen of spondylolisthesis. Cutoff point in DSCSA 100 mm2 as diagnostic value for lumbar spinal stenosis. Region of interest (ROI) was used to measure of DSCSA, calculation was done by measure the center portion of disk level by axial T1 image (figure 2-1).[14]

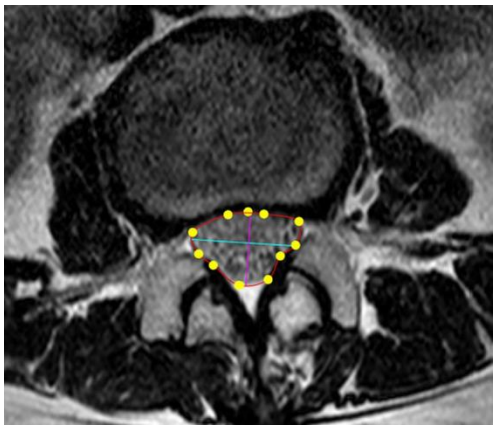

figure 2-1 Illustration of the dural sac cross-sectional area measurement technique [14]

Stenosis was classification according to multi level of narrowing spine when see stenosis at least two level and over. If patients have multi level stenosis we measure the most narrow site of stenosis while if one level calculate this single level lumbar stenosis.

Other measurement to diagnosis severity of stenosis by calculate stenosis ratio (SR) (figure 2-2) which are define it the ratio of the cross sectional area of spinal canal at intervertebral disk to the cross sectional area of next middle vertebra levels above .

Figure 2-2 The lumbar canal was calculated by a ratio of the mid-sagittal spinal canal diameter at the level of the intervertebral disc to the spinal canal diameter at the mid-vertebra level of the upper vertebral body[(15)]

When the ratio between 0.7 to 1 there were no stenosis. Ratio between 0,5-0.7 this mean mild stenosis, if value between 0,25-0.5 mean

moderate stenosis and lastly if ratio range from 0- 0.25 there severe stenosis.

The grading is based on the CSF/rootlet ratio as seen axial T2 images and was conceived following observation of the different patterns according which the rootlets were disposed within the dural sac while the patient rested supine during MRI acquisition.

Description of the grading is as follows (Schizas grading system),(figure2-3): [16]

Grade A stenosis: there is clearly CSF visible inside the dural sac, but its distribution is inhomogeneous:

A1: the rootlets lie dorsally and occupy less than half of the dural sac area.

A2: the rootlets lie dorsally, in contact with the dura but in a horseshoe configuration.

A3: the rootlets lie dorsally and occupy more than half of the dural sac area.

A4: the rootlets lie centrally and occupy the majority of the dural sac area.

Grade B stenosis: the rootlets occupy the whole of the dural sac, but they can still be individualized. Some CSF is still present giving a grainy appearance to the sac.

Grade C stenosis: no rootlets can be recognized, the dural sac demonstrating a homogeneous gray signal with no CSF signal visible. There is epidural fat present posteriorly.

Grade D stenosis: in addition to no rootlets being recognizable there is no epidural fat posteriorly.

We defined grade A as no or minor stenosis, B as moderate stenosis, C as severe stenosis, and D as extreme stenosis.

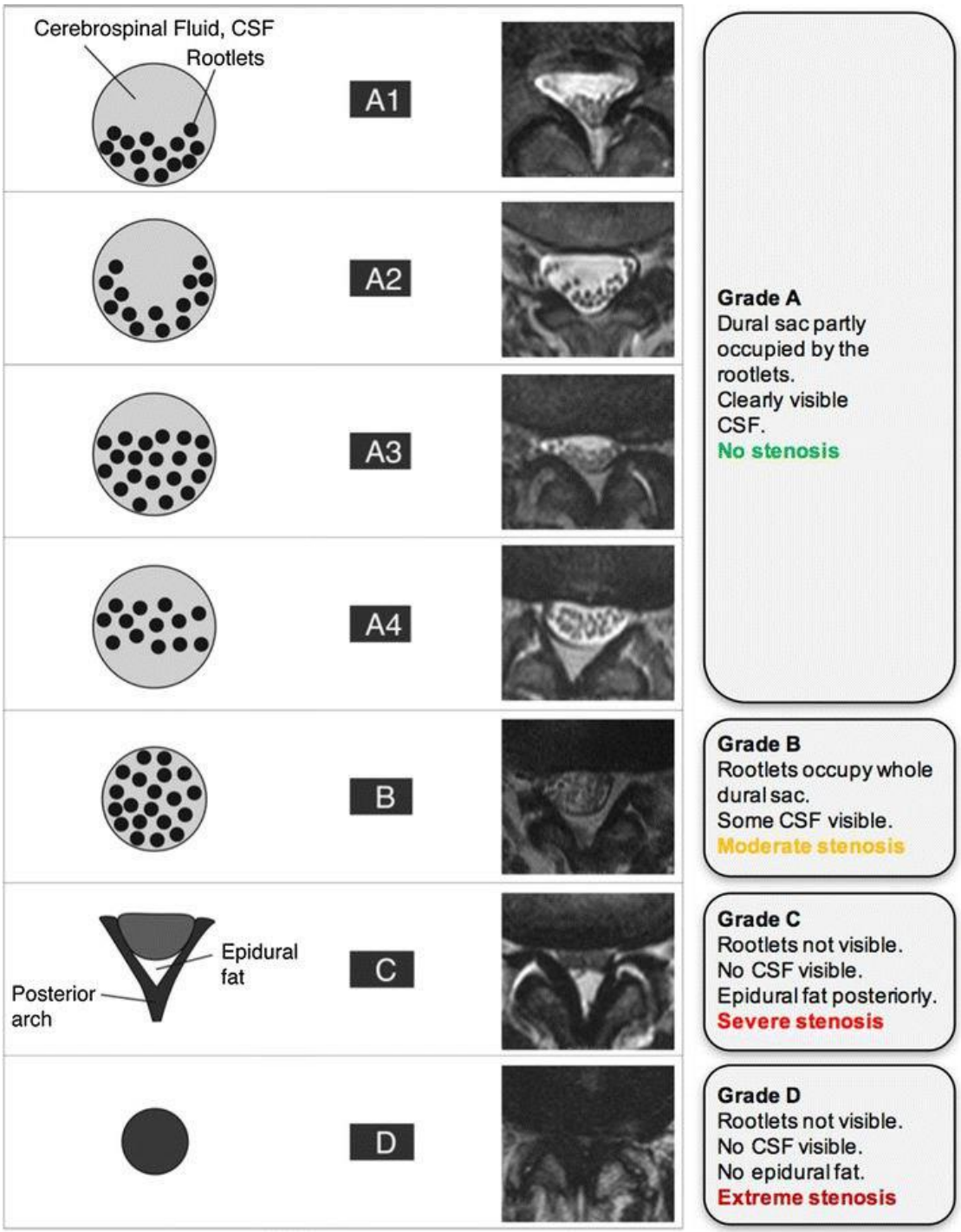

Figure 2-3 Illustrative Schizas grades of lumbar spinal stenosis. Grades C and D are severe stenosis .[(16)]

The level of spondylolisthesis were also identified.

Image analysis

After calculation of DSCSA then the level from L1-L2 to reach L5-S1 was assess to search about the stenosis and other pathology as follow,

1- circumference annular bulging, this seen when there is extension in intervertebral disk outside the edge of neighboring bone in range more than 50% of its outer border.

2- thin annular bulging it same the circumference annular bulging but with saving concavity of posterior disc.

3-annular tears, the external layer of intervertebral disc show focal region of high signal intensity.

4-foramian disc herniated when external border of intervertebral disc emerge less than fifty percent outside the boundary of neighboring bone, these may occur unilateral or some time bilateral. Focused in two or one foramina

5- center or para-central disc herniated when external border of intervertebral disc emerge less than fifty percent outside the boundary of neighboring bone, bulging in center or sub articular inside of spinal canal.

6- spondylolisthises, displaced of vertebral body in anterior or posterior side more than or equivalent to one mm above the vertebral body down it.

7- pars defects in unilateral or bilateral.

8- disc herniated in anterior side.

9-Posterior vertebral element show increase signal intensity called stress reaction.

Ethical approval

The study was approved by our institutional ethics committees and a verbal consent was obtained from each patient before participating in the study.

Statistical analysis

Data was collected and included in a data based system and analyzed by statistical package of social sciences ((SPSS, Inc., Chicago, IL, USA)) version 23.

Parametric data were expressed as mean ± standard deviation (SD) While non-parametric data were expressed as percentages.

Chapter Three

Results

Result:

The mean age of patients was 49.1±8.3, 55% of them in belong groups of 40-60 year and 45% of patients in group of 20-39 year. Ratio of males to females was 1.3: 1 the male constituent 56.7% of sample, these results present in table 1

Table 1: show demographic characters of sample.

		Number	%
Age group	20-39 years	27	45%
	40-60 years	33	55%
		60	
Gender	Male	34	56.7%
	Female	26	43.3%

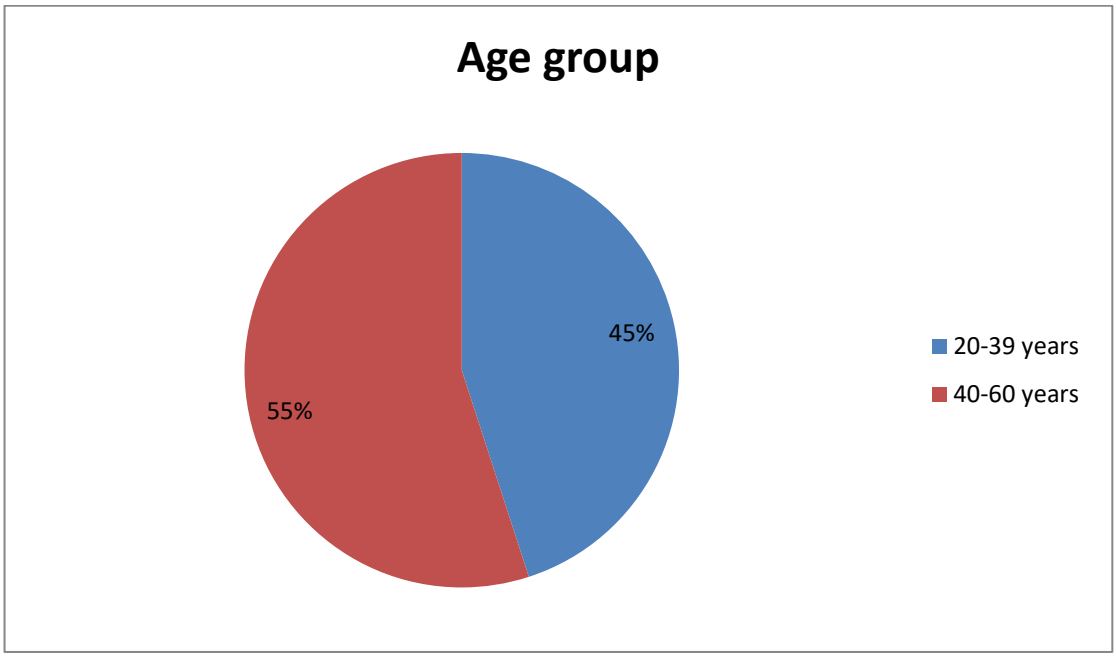

Figure 3-1: Age group distribution.

About the clinical features 53.3% of patients presented with lower back pain while 25% show leg pain and 16.7% reveal both lower back pain and leg pain. Other manifestation numbness in 8.3% and intermittent claudication in 5%, as show in table 2.

Table 2: show the presenting clinical feature of patients.

Clinical features	Number	%
Lower back pain	32	53.3%
Leg pain	15	25%
Both	10	16.7%
Numbness and tingling	5	8.3%
Intermittent claudication	3	5%

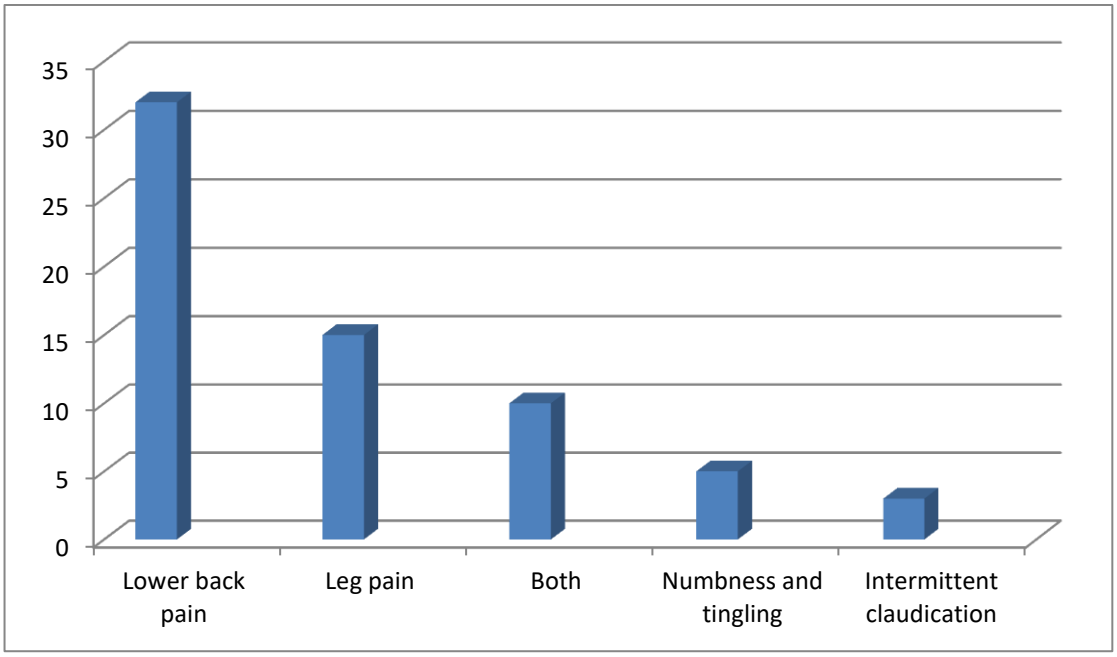

Figure 3- 2: clinical features distribution.

Regarding the MRI findings, the stenosis was presented in 83.3% of patients of them 13.3% was mild stenosis, 63.4% was moderate stenosis and 6.6% with severe stenosis (figure 3-3), as in table 3. The spinal level of L4-L5 was the major region of stenosis in 50% of sample whereas L3-L4 26% of patients (figure 3-4), and the L2-L3 level 16% as in table 4.

Table 3: Reveal spinal findings in MRI.

Spinal finding		**Number**	**%**
Stenosis	Mild stenosis	8	13.3%
	Moderate stenosis	38	63.4%
	Severe stenosis	4	6.6%
No stenosis		10	16.7%
Total		60	

Table 4: show level of stenosis by MRI.

Level of stenosis	**Number**	**%**
L 2-L3	8	16%
L 3-L4	13	26%
L 4-L5	25	50%
L 5 – S1	4	8%
Total	50	

(a) (b)

Figure 3-3 T2-WI MRI depicting moderate spinal stenosis at L4/L5 and L5/S1 level sagittal(a) , and (b) axial view.

Figure 3-4 T2-WI MRI depict multiple spinal stenosis at LSS

Other results, 34% of patients presented with disc degeneration (figure 3-6), 20% spondylolisthesis, 12% facet degeneration, 10% scoliosis, 16% annular fissure and 8% disc contour, as in table 5.

Table 5: show MRI pathology of spine.

pathologies of stenosis by MRI	Number	%
Spondylolisthesis	10	20%
Disc degeneration	17	34%
Facet degeneration	6	12%
Scoliosis	5	10%
Annular Fissure	8	16%
Disc contour	4	8%
Total	50	

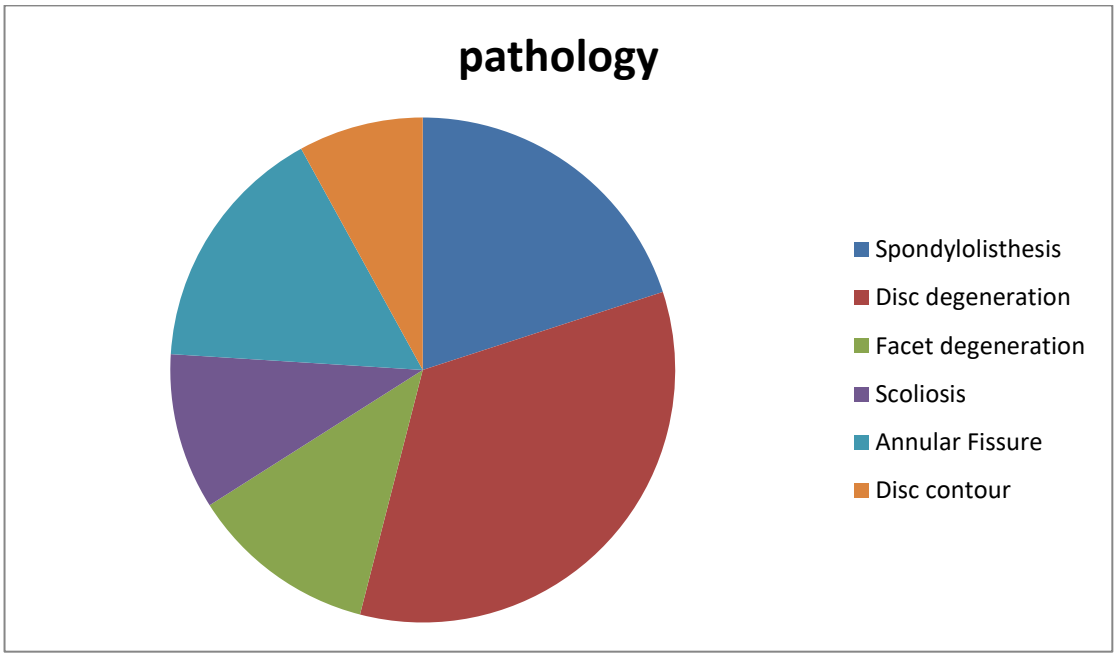

Figure 3-5: show causes of spinal stenosis.

Figure 3-6 sagittal T2-WI MRI showing degeneratve changes , including disc bulging , loss of disc height , facet and ligament hypertrophy producing spinal stenosis at L4/L5 level

The Dural sac cross sectional area value to diagnosis of spinal stenosis in our study was100 mm^2 these give sensitivity 84%, specificity was 92% area under curve 0.89 (0.81-0.94) and p values 0.002, it seen in table six.

Table six: show cut off value for diagnosis of spinal stenosis.

Variables case	Cutoff	Sensitivity	Specificity	AUC(95%CI)	p-value
Dural sac cross sectional area	100 mm^2	84%	92%	0.89(0.81-0.94)	0.002

More over the signs of root compression illustrated by MRI co-exist with spinal stenosis, 64% of patients had nerve root compression, 30% loss of CSF(figure 3-8) , 6% show loss of epidural fat surrounding the dura (figure 3-7) , Decrease thickness of spinal cord was seen in 12% and 14% presented with Decrease signal intensity . As in table 7.

Table 7: show signs appear in MRI.

Signs in MRI	No.	Percentage
Nerve root clumping	23	46%
Loss of CSF	11	22%
Loss of epidural fat	3	6%
Decrease thickness of spinal cord	6	12%
change signal intensity	7	14%
Total	50	

Figure 3-7 MRI depicting CSF effacement and epidural fat posteriorly at L4/L5 level

Figure 3-8 MR myelography of lumbar spine showing severe L3/4 , L4/L5 lumbar canal stenosis

Chapter four

Discussion

Discussion :-

Magnetic resonance imaging become the top most important in evaluation of spinal stenosis. More over this modalities in spite of beneficial in diagnosis of lumbar spine stenosis but repeatability in evaluation of intervertebral disc abnormality and stenosis is questionable. In addition, it cost in over use, and cost efficiency are high, so if use in every case of suspected of stenosis give great of financial burden. But it still of much importance in preoperative planning and monitor of treatment, when the sign and symptoms correlated with image finding[7].

-Our study found the mean age of patients was 49.1±8.3, 55% of them belong group 40-60 year and 45% belong group 20-39 year. Ratio of Males to females was 1.3: 1 the male constituent 56.7% .

Hong et al. investigated 74 patients with central lumbar stenosis, they reported the mean age was 56 year of sample and age range 25-80 year. Gender composition, female was 41 and male 33[14] in contrast to our study.

Al-Jaberi et al, study enrolled fourteen men and 26 women, with average age 52.1±10.3, it has sample age range from 30-75 year[17].

Other study had the average age of study population was 62.3±8.4 and comprised 58 (45.7%) males and 69 (54.3%) females[18].

A cohort study by Hwang et al, show the mean age is 68 year, these cohort had older age group which are presented with greater number of patients suffering from disc degeneration in compared to our study[19].

The difference between study in gender and mean age depend on site of study in which population under review such as in Swedish study

recorded mean age was 70 year and nordsten study had mean age was 66 year[20].

Age consider a risk factors in evolution of lumbar spinal stenosis, variable study show various value of DSCA between participants depend on differences in age composition of studies, in Swedish study reported low cutoff value of DSCA which might also influence the result. and most of study across section that study patients with complain in specific time period[20].

the clinical features of our patients, 53.3% of presented with lower back pain while 25% show leg pain and 16.7% reveal both lower back pain and leg pain. Other manifestation numbness in 8.3% and intermittent claudication in 5% it in consist with study of Hong et al[14]. they reported more common presentation of patients lower back pain and leg pain, in same line of finding by Al-Jaberi et al. the similar findings because of root compression that give mostly the same presentation in patients[17].

Regarding the MRI findings, the stenosis was presented in 83.3% of patients of them 13.3% was mild stenosis, 63.4% was moderate stenosis and 6.6% with severe stenosis, these result close to Ji Hee Hong result [18].

On other hand a study was evaluated spinal stenosis level, there were 59.4% illustrated no stenosis while 34.6% had mild stenosis and only 5% had moderate stenosis, none of participants image had severe stenosis[17].

In addition, Bhalla thesis enrolled patients from two different center with MRI finding prepared for surgical treatment, first group from Trondheim Norway had 78% of them had moderate stenosis and second group from Boston USA show 68% of patients with moderate stenosis[21].

Moojen et al. assessed the l54 patients with lumbar spinal stenosis they found 76% of sample are categories as mild and moderate stenosis[22].

Sigmundsson et al. evaluated a group of patients with 100 presented with lumbar spinal stenosis, prepared for spinal surgical treatment, 90% of them had mild to moderated finding, this is considerably higher than the findings of NORDSTEN study which is show 87%[23] , which are close to our study.

This minor difference in presentation of intensity of stenosis between studies might be due to variable sample composition and various score and grade uses for measurement of stenosis[17].

Our study reported the spinal level of L4-L5 was the major region of stenosis in 50% of sample whereas the L2-L3 level 16% and L3-L4 26% of patients. In line of H-J PARK study show the incidence of the lumbar spinal stenosis, 15% in L3-L4, 66% in level of L4-L5 and 19% in L5-S1[24].

In agreement with our study Hong et al. reported 10.9% of patients with stenosis level of L2-3, 16.4% in level L3-4, 76.7% in level L4-5 and 32.8% in level L5-S1[14].

Authors evaluated subjects with congenital lumbar spinal stenosis in compared with normal individual by used of MRI images, they described patients with LSS group had single and multi level affected with L3,L4 and L5 intervertebral disc segment more common than other level, and severe stenosis rarely happened[25].

These studies finding give strongest evidence to our study because resemble of common presentation of L4L5 level of stenosis.

Other results in our study, there were 34% of patients presented with disc degeneration, 20% spondylolisthesis, 12% facet degeneration, 10% scoliosis, 16% annular fissure and 8% disc contour it in consistent

with study by *Hong et al.* whose reported disc degeneration common pathology followed by spondylolisthesis which seen nine patients in one level had associated spondylolisthises and two patient had spondylolistheses at further than one level. Spondylolistheses was great often establish at the L4-L5 level[14].

Doktor et al. study reveal the common pathology show in MRI image were disc degeneration spondylolistheses, scoliosis, annular fissure, ,facet joints degeneration and disc contours[26] .

Carrino et al. study more than 100 participants to examine the agreement between investigator to assess variable MRI pathology he found the disc degeneration, spondylolisthesis, endplate change, annular fissure and facet degeneration [27].

More over, Hwang et al[19] cohort of 45 subjects underwent spinal stenosis surgery categories 80% of subjects in study with worse disc degeneration on MRIs at baseline, other study reported 58% compare to our study 34% of patients with disc degeneration[20].

Akar et al. study reported the presence of sever facet degeneration in group of 100 patients with lumbar spinal stenosis planning for surgery, they stated 14 % had facet degeneration these finding in same line of NORDSTEN study which are reported the facet happened in 11% and it close to our study 12%[28].

The variables presentation between studies regarding the pathological causes of spinal stenosis, these may be due to studies carried out in cross sectional design and enrolled patients admitted to hospital with signs and symptoms of spinal stenosis not necessitated representative to all causes of lumbosacral spine and cannot be generalized, because limiting to patients and time of studies[27].

Table six in our result show the Dural sac cross sectional area value to diagnosis of spinal stenosis in our study was100 mm^2 these give

sensitivity 84%, specificity was 92% area under curve 0.89 (0.81-0.94) and p-value 0.002, it in consist to result of Hong et al. [14] some authors use lower cut off value of sac cross section area, the difference in cut off value between study due recruited older age group and variable gender enrollment in study[30].

The signs of root compression in our study that illustrated by MRI co exist with spinal stenosis, there were 64% of patients had nerve root compression, 30% loss of CSF, 6% show loss of epidural fat surrounding the dura, decrease thickness of spinal cord was seen in 12% and 14% presented with Decrease signal intensity, it agree with Yusof MI, et al[30] study but disagree with Hwang et al[19]. the cause might be due to difference in types of pathology found by variable studies[31].

Chapter Five
Conclusion and Recommendation

Conclusion

1- MRI modalities a useful diagnostic option in evaluation of lumbosacral spinal stenosis, as it can describe appropriate variable pathological changes, such as disc degeneration.

2- Magnetic resonance images measurement of spinal canal associated to the level of disabilites.

Recommendation

1- We recommend to use the MRI good confirmatory diagnostic modalities to investigate the spinal stenosis

2- MRI study could be a first step to put a plan for management of lumbar spinal stenosis .

Chapter six

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وزاره التعليم العالي والبحث العلمي

كلية الطب/جامعة بابل

رسالة

دور التصوير بالرنين المغناطيسي في تشخيص أسباب تضيق القناة الشوكية في الفقرات القطنية والعجزية

مقدمة من قبل الطالبة
علياء حسين جواد
بكلوريوس طب وجراحه عامة

بإشراف الاستاذ الدكتور
اسامه اياد عبدالستار
أستاذ الاشعة التشخيصية

ملخص البحث

خلفية البحث:

تضيق القناة الشوكية: هو تضيق الثقبة العصبية التي تؤدي إلى الضغط على النخاع الشوكي أو جذور الأعصاب. أصبح التصوير بالرنين المغناطيسي أكثر الدراسات استخدامًا لتشخيص التضيق الشوكي. يستخدم التصوير بالرنين المغناطيسي إشارات كهرومغناطيسية لإنتاج صور للعمود الفقري. تُعد التصوير بالرنين المغناطيسي مفيدة لأنها تظهر عددًا أكبر من الهياكل ، بما في ذلك الأعصاب والعضلات والأربطة ، مقارنة بالأشعة السينية أو التصوير المقطعي المحوسب.

اهداف الدراسة:

تقييم الدور المفيد للتصوير بالرنين المغناطيسي في تقييم وتمايز أسباب التضيق الشوكي في العمود الفقري القطني العجزي.

طرق البحث:

تم توظيف دراسة مقطعية لمريض آلام أسفل الظهر ، وتم إطلاقها في 1 أغسطس 2021 إلى 1 سبتمبر 2022 ، في قسم الأشعة بمستشفى بابل التعليمي. يتكون جمع البيانات بناءً على استبيان محدد جيدًا من ثلاثة أجزاء. تم إجراء التصوير بالرنين المغناطيسي باستخدام 1.5 أنظمة تسلا (Achieva ؛ Philips Medical Systems ، هولندا) باستخدام ملف جسم SENSE. تم جمع البيانات وتحليلها باستخدام SPSS 23.

النتيجة:

كان متوسط عمر المرضى 49.1 ± 8.3 ، 55٪ منهم في الفئة العمرية 40-60 سنة و 45٪ في الفئة العمرية 20-39 سنة. كانت نسبة الذكور إلى الإناث 1.3: 1 المكونة للذكور 56.7٪ من العينة. نتائج التصوير بالرنين المغناطيسي ، تم تقديم التضيق في 83.3٪ من المرضى 13.3٪ كان تضيقًا خفيفًا و 70٪ كان تضيقًا معتدلًا ، كما هو موضح في الجدول 3. كان مستوى العمود الفقري من L4-L5 هو المنطقة الرئيسية للتضيق في 50٪ من العينة بينما المستوى L2-L3 16٪ و L3-L4 26٪ من المرضى.

الخلاصة:

تعد طرائق التصوير بالرنين المغناطيسي خيارًا تشخيصيًا مفيدًا في تقييم التضيق الشوكي القطني العجزي ، حيث يمكنها وصف التغيرات المرضية المتغيرة المناسبة ، مثل تنكس القرص.