

Original Research Article

Incidental Finding during MRI Evaluation of Lumbosacral Disc Prolapse in Adults in Al- Hilla Teaching Hospital

Hadeel Abdul-Sattar Qasim^{1*} Hassaneen Al-Bayati¹ Nashwan Aziz Mahmood²

¹College of Medicine, University of Babylon, Hilla, IRAQ

²Al-Hilla General Teaching Hospital, Al-Hilla, IRAQ

*E-mail:hadgold10@gmail.com

Accepted 3 October, 2017

Abstract

Due to increasing number of MRI imaging , detection of incidental findings not related to main complain of patient were elevated. Aim of study to find the frequency and types of spinal and extra spinal incidental findings of lumbosacral spine MRI in adult patient with suspected intervertebral disc prolapse. Across sectional study conducted from 2016 – 2017 in Al-Hilla teaching general hospital on 805 adult patients with female–male ratio 460: 345, age range 18-90 years undergone lumbosacral spine MRI due to suspected intervertebral disc prolapse using 1.5 T MRI unit. Incidental finding not related to patient symptoms, evaluated by radiologist, Chi square test was used to find the relation between incidental finding and patient characteristics. Incidental findings found in 275 patients out of total 805 age range 18-90 years with percentage 34.2%. among this vertebral haemangioma was commonest forming (27%), then tarlov cyst forming (2.7%), ovarian cysts (0.87%), perineural cysts (0.74%), each one of intraspinal mass, renal cysts and nabothian cyst found (0.5%) for each , bone lesion form (0.37%), uterine mass form (0.37%), arachnoid cyst form (0.25 %) and meningocele formed (0.125%). There was significant correlation between occurrence of these incidental findings in regard with patient's age and sex, P-value < 0.001. So Incidental findings is common in clinical practice and increasing. Majorities are benign and it is associated with patient age and sex. Providing information on these findings help to manage and deal with them and it can affect patient health.

Key Words: Incidental findings, lumbosacral spine, Magnetic resonance imaging.

النتائج العرضية المكتشفة خلال فحص الرنين المغناطيسي لمرضى الانزلاق الغضروفي للفقرات القطنية في المرضى البالغين في مستشفى الحلة التعليمي

الخلاصة

النتائج العرضية في التصوير الطبي بازدياد نتيجة الاستخدام المتزايد لفحص الرنين المغناطيسي بصورة خاصة. الهدف من دراستنا هو لاجاد نسبة انتشار وانواع النتائج العرضية التي توجد في المنطقة القطنية العجزية للعمود الفقري خلال فحص الرنين المغناطيسي لمرضى الانزلاق الغضروفي. اجريت دراسة مقطعية في الفترة ايلول 2016 لغاية تموز 2017 في مستشفى الحلة التعليمي على 805 مريض نسبة النساء للرجال كانت 460:345 اعمارهم تراوحت بين 18 – 90 سنة ، اجري لهم فحص الرنين المغناطيسي للمنطقة القطنية العجزية لاشتباه وجود انزلاق غضروفي باستعمال جهاز الرنين 1.5 تسلا وتم تقييم النتائج العرضية التي ليس لها علاقة باعراض المريض. تم استخدام مربع كاي الاحصائي لاجاد العلاقة بين حدوث النتائج العرضية مع عمر وجنس المرضى. كانت النسبة المئوية لحدوث النتائج العرضية 34.2% اي 275 وتوزعت النتائج كالاتي: 27% ورم وعائي وريدي فقري، 2.7% كيس تارلوف، 0.87% اكياس المبيض، 0.74% اكياس حول العصب، 0.5% لكل من كتل داخل القناة العظمية واكياس الكلية وكيس نابوتي لعنق الرحم، 0.37% لكل من اعتلال العظام و تليف الرحم، 0.37% كيس عنكبوتي في المنطقة الجافية و شوهدت القيلة السحائية في 0.125% مريض وتم اجاد علاقة معنوية بين حدوث هذه النتائج العرضية وعمر وجنس المريض. النتائج العرضية شائعة الحدوث في فحوصات الفقرات. معظم هذه النتائج حميدة وترتبط بعمر وجنس المريض. أن توفير معلومات عن تلك النتائج يساعد في علاج هذه الحالات و تحسين صحة المريض.

الكلمات المفتاحية: نتائج عرضية، فقرات قطنية عجزية، الرنين المغناطيسي.

Introduction

Incidental findings in research and clinical practice, they are defined as unexpected abnormalities that is not detected before and found incidentally on imaging and it is unrelated to the reason of examination. Lumbar spine incidental findings may be insignificant clinically or it may be important spinal and/or extra spinal incidental finding and it is more important than the spinal disease and related directly to patient symptoms. It involves various abnormalities from abdominal and pelvic organs with different diseases encountered [1]

There is significant importance to know how to handle these finding when appear on imaging so, detecting the prevalence of these findings, and ways to handle them, their impact on patient, and on imaging techniques [2] due to this importance it should be reported in reports and notification of patient is mandatory and lead to timely intervention [3] and avoid potentially serious consequences of patient and protect radiologist from involving in medico legal implication [4].

Ethical and practical discretion implement radiologist to report IFs identified on imaging despite it provide little benefit and expose patient to great psychological distress [5].

In a study on claims against radiologists form 5 % of all claims of the physician insurers association of America from 1985 to 1998 and was due to missed finding [2].

Back pain is one of the major public health problems accounts for 60-85 % prevalence in life time; studies found back pain is the second leading cause of job absenteeism after cold, one of the major causes of back pain is Discopathy [2].

The advent of magnetic resonance imaging (MRI) led to outstanding development in diagnosis of disease and consequently in treatment of spinal problems. The possibility of having multidimensional view of anatomy and high resolution images of soft tissue and the ability to use different sequences in MRI, allow for detailed view of the disc, Fat, nerves, ligaments and bone without the need for injection of contrast agent or exposure to radiation. That's why today MRI, as the best primary test in patients with back pain, is replaced by computerized tumor scan (CT scan) [6].

Many studies concerned with IF, Park *et al* [7].study focused on spinal abnormalities reported in patients undergoing MRI of lumbar spine because of prolapsed intervertebral disc is suspected. Quattrocchi *et al.* determined the prevalence of clinically and non-clinically significant extra spinal findings and they evaluate the rate of undetected finding in archived radiological reports, the author classify the abnormalities according to a modified CT colonography reporting and data system (C-RADS) to estimate non detection[1]. Tuncel *et al.* studied the prevalence of and reporting rate of incidental extraspinalIF in adult outpatient undergoing MRI of lumbar spine [8]. Sobhan et al.(2016)cross-sectional study was conducted in patients clinically diagnosed with Discopathy and approved MRI reports. Study is an attempt to investigate the prevalence and type of lumbar spinal MRI incidental findings in these patients[2].

Materials and Methods

Study Design:

This cross sectional study was approved by local ethical committee, conducted from September 2016 – July 2017 Patient referred for MRI evaluation in Al-Hilla teaching hospital in Al-Hilla city –Iraq

Demographics were collected from electronic medical records and data collection form is used. There were 805 patients, 345 male, 640 female. Patients with known malignancies, patient present in state of acute trauma and patients younger than 18 years old are excluded from our study.

MRI Device:

All MRI imaging were performed by Philips MR system Achiva 1.5 T Netherlands (release 3.2.1.0 2010-6-9) and MR system Intera 1.5 T (release 2.5.3.0 2007 -9-28).Fig.(1)

The routine protocol for the lumbar spine imaging in our hospital with spinal coil in supine position was use, which included T2 sagittal turbo spin echo (TR) 3000 ms, TE 120 ms, matrix 148/352r , FOV 320 mm, NSA 3, turbo factor 24 , EPI factor 1, 2 stacks, TSE, coil SENSE – SPINE. T1 W sagittal , TSE , TR 473, TE 9 ms, matrix 148 / 352, FOV 320 T2W axial images TR 3000, TE 120 ms, matrix 148/532, FOV 170 mm Myelography TR 8000, TE 1000, FOV 200 mm, NSA 2



Figure 1: MRI unit in AL- Hilla Teaching Hospital

Image Analysis

MR image interpretation is done by academic radiologist, during reporting of outpatient in our MRI unit. Patient age, sex in addition to incidental findings that included in our FOV of examined patients.

Statistical Analysis

Frequency distribution of collected data were calculated, relationship of patient characteristic with finding is analyzed using Chi square test. patient classified regarding sex (male – female ratio) and regarding age divided into groups : 18-29 years , 30-40 years , 41-50 years , 51-60 years , 61-70 years and older than 71 years , A P - value < 0.05 was considered to detect statistical significance.

3. Results

Total sample size of our study was 805 patients. The age range of patients was (18-90 years)Sample divided into six age groups 18-29 ys , 30-40 ys , 41-50ys , 51-60 ys 61-70 ys and older than 70 ys figure(3-1).

Tables (1) and (2) summarizes the result of our study, Total number of patients with incidental findings was 275/805 patients (34.1 %), female 185/275 (67.3 %), male 90/275 (32.7 %). Age group 41-50 years show the highest number of detected IFs.and sex regarding presence and absence of IFsThere were significant correlation between frequency distribution in relation to sex and in relation to age of patients with P -value less than 0.001.The highest number of Ifs were seen in young and middle age group 40-60 years as in figure (2)

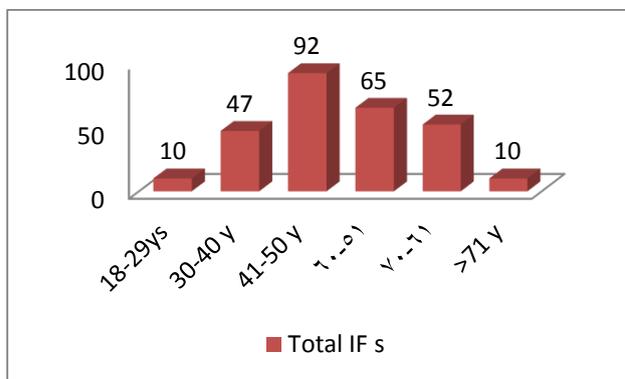


Figure 2: Distribution of IFs in different age groups.

Haemangioma is benign vascular tumor constitute largest number of IF seen in our study , its seen in 220/275 forming 27% of total IFs , in females seen in 141/275(64%) and in male it is seen in 79/275(36%) patient , it is divided into two groups multiple and single hamangioma.

In female it divided nearly to equal numbers 70 with single haemangioma and 71 patients with multiple levels vertebral haemangioma, In male the distribution is slightly different and constitute 44 single haemangioma and 35

multiple haemangioma,regarding age groups as seen infigure (3), it appear to occur more frequently in young groups (41-50 y and 51-60 y) in both males and females. Figure (4) show haemangioma on MRI.

Tarlov cyst: Constitute 2.7 % of total IFs, 21/275, seen in female in higher number 18/21(86%) in male 3/21 (14%) of examined patients see figure (5).

Perineural cyst Seen in 6/275 (0.74%), 2/6(33%) males and 4/6 (67%) females, figure

(6) show MRI image of perineural cyst.

Table 3-3: frequency of each IFs in term of age groups

Age	18-29 y	30-40y	41-50y	51-60y	61-70y	>71y	Total No. (%) of IF	P-value
Without IFs	76	138	166	93	53	4	530	
Hemangioma No.(%)	7(3.2)	35(16)	73(33)	58(26)	38(17)	9(4)	220(27)	<0.001
Tarlove cyst	0(0)	1(5)	7(33)	3(14)	10(47)	1(5)	21(2.6)	
perineural cyst	1(17)	3(50)	2(33)	0(0)	0(0)	0(0)	6(0.75)	
intraspinal lesion	1(25)	2(50)	1(25)	0(0)	0(0)	0(0)	4(0.5)	
bone lesion	0(0)	0(0)	1(33)	0(0)	2(67)	0(0)	3(0.37)	
renal cyst	0(0)	0(0)	0(0)	3(75)	1(25)	0(0)	4(0.5)	
uterine masses	0(0)	0(0)	2(67)	0(0)	1(33)	0(0)	3(0.37)	
ovarian cyst	1(14)	3(43)	3(43)	0(0)	0(0)	0(0)	7(0.87)	
Nabothian cyst	0(0)	1(25)	2(50)	1(25)	0(0)	0(0)	4(0.5)	
meningiocyte	0(0)	0(0)	1(100)	0(0)	0(0)	0(0)	1(0.124)	
Arachoid cyst	0(0)	2(100)	0(0)	0(0)	0(0)	0(0)	2(0.25)	
Total pt.	86	183	255	169	98	14	805	

Renal cyst: Four cyst seen 4/275(0.5%), 3/4 (75%) in females and 1/4 (25%) in males figure (7) show MRI image of renal cyst.

Ovariancyst Seven ovarian cyst seen 7/275 (0.87%) figure (8) show MRI image of ovarian cyst. **Uterine solid lesion** Three cases of solid uterine masses seen 3/275 (0.37%) two of them seen in 41-50 age groups and the other in 61-70 age group. See Figure (9) show MRI of solid lesion

Nabothian cyst Of uterine cervix seen in 4/275(0.5%) females , one detected in 30-40 y age group , two in 41-50 y age group and one in 51-60 y group. Figure (10) show MRI image of Nabothian cyst. **Intraspinal solid lesion:** Four intraspinal masses have been seen 4/275 (0.5%).

3/4 (75%) in females and 1/4 (25%) in males. Figure (11) show example of MRI image of intraspinal solid lesion.

Bone lesion Three bone lesion is visualized 3/275 (0.37%), age group was 41-50 y for sacral heterogeneous destructive lesion figure (12). and vertebral body hypointense SI lesions Fig. (13)Seen in two patients of 60-71 years age group.

Arachnoid cyst Two cases is detected at upper lumbar level, 2/275 (0.25%) in two male patient of 30-40 y age group. MRI image of arachnoid cyst seen in figure (14).

Meningiocyte One case seen in young female 1/275 (0.124%) of 42 years old. figure (15) show MRI image of meningeocyte.

Table 3-4: Frequency of distribution of IFs in male and females

age	MaleNo.(%)	Female No. (%)	Total No. (%) of patients	P- value
Hemangioma	79(36)	141(64)	220	<0.001
Tarlove cyst	3(14)	18(86)	21	
Perineural cyst	2(33)	4(67)	6	
Arachnoid cyst	2(100)	0(0)	2	
Intraspinal lesion	1(25)	3(75)	4	
Bone lesion	2(67)	1(33)	3	
Renal cyst	1(25)	3(75)	4	
Uterine masses	0(0)	3(100)	3	
Ovarian cyst	0(0)	7(100)	4	
Nabothian cyst	0(0)	4(100)	7	
Meningocele	0(0)	1(100)	1	
Total IF	90	185	275	

P-value of distribution of IFs in relation to age was <0.001 significance

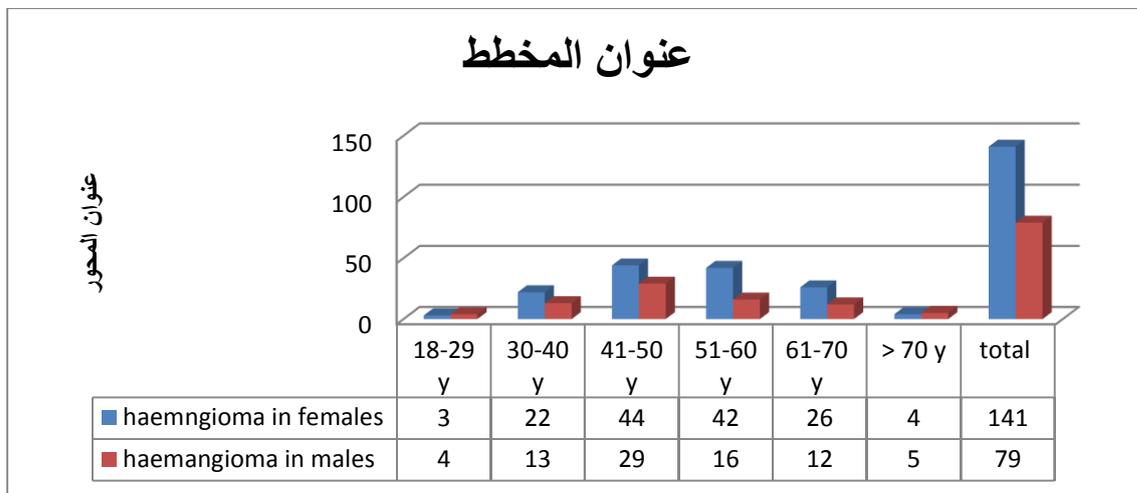


Figure 3: show frequency of haemangioma in different age groups in males and females.



Figure 4: MRI of 58 year-old man with vertebral hamangioma A). sagittal T2 WI (B) .sagittal T1 WI, there is well defined oval ,hyperintense area on T1 and T2 affect S1 , L4 , L3 vertebra .(C) T1 and T2 WI show hyperintense area involve most of L3 vertebral body and other haemangioma on L4.



Figure 5: lower lumbar spine MRI. **A.** sagittal T2 WI , **B.** sagittal T1 , **C.** sagittal T1 with contrast show well defined Tarlov cyst of CSF intensity T1hypointense , T2 hyper intense , not enhanced after contrast administration at level S1/S2.

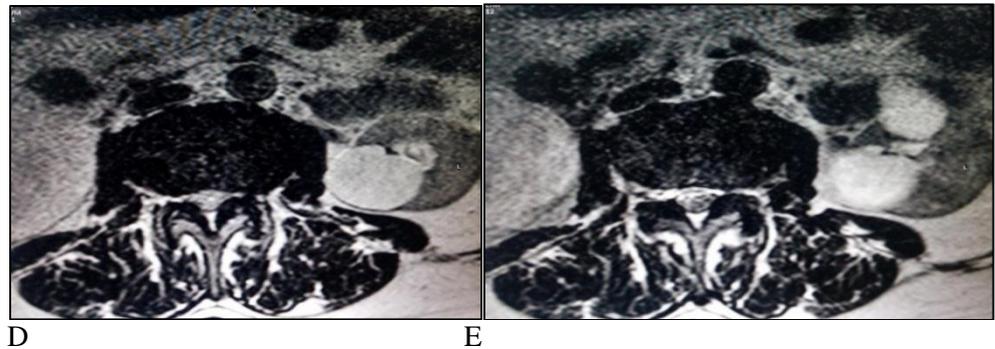
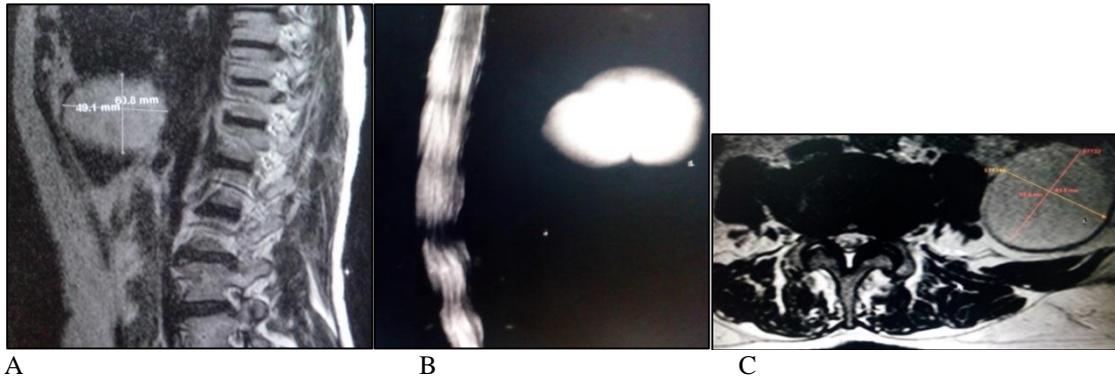


Figure 7: MRI of 54 years old woman with renal cysts **A.** T2 WI parasagittal ,**B.** myelogram study of lumbar spine.**C, D, E** Axial T2WI at level of renal area there are multiple renal bilateral renal cysts largest measure 60 x 55 x 44 mm in diameter.



Fig.6



Fig.8

Figure 6: myelogram study show multiple at exit of nerve roots forming perineural cysts
Figure 8: 36 year old woman with well-defined 40 x 30 mm ovarian cyst of fluid intensity

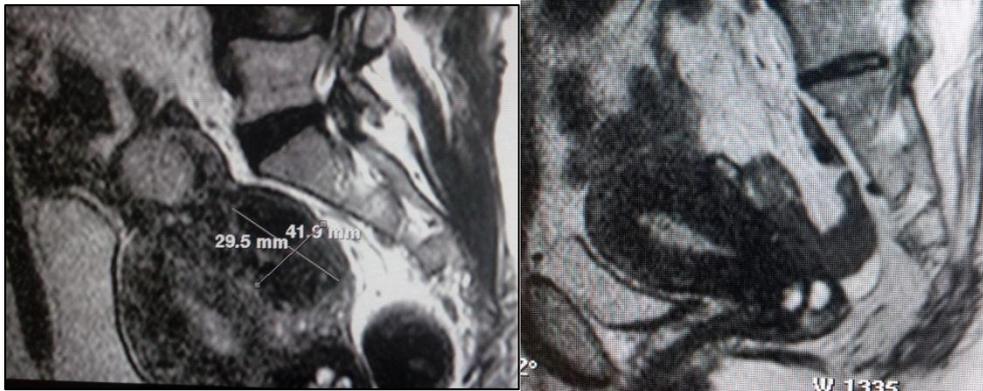


Fig. 9

Fig.10

Figure 9: LSS MRI (A). T2 WI parasagittal image show other hypointense mass measure 41.9 x 29.5 mm in diameter picture of intramural uterine leiomyoma.

Figure 10: Nabothian cysts seen as well-defined cystic areas in uterine cervix

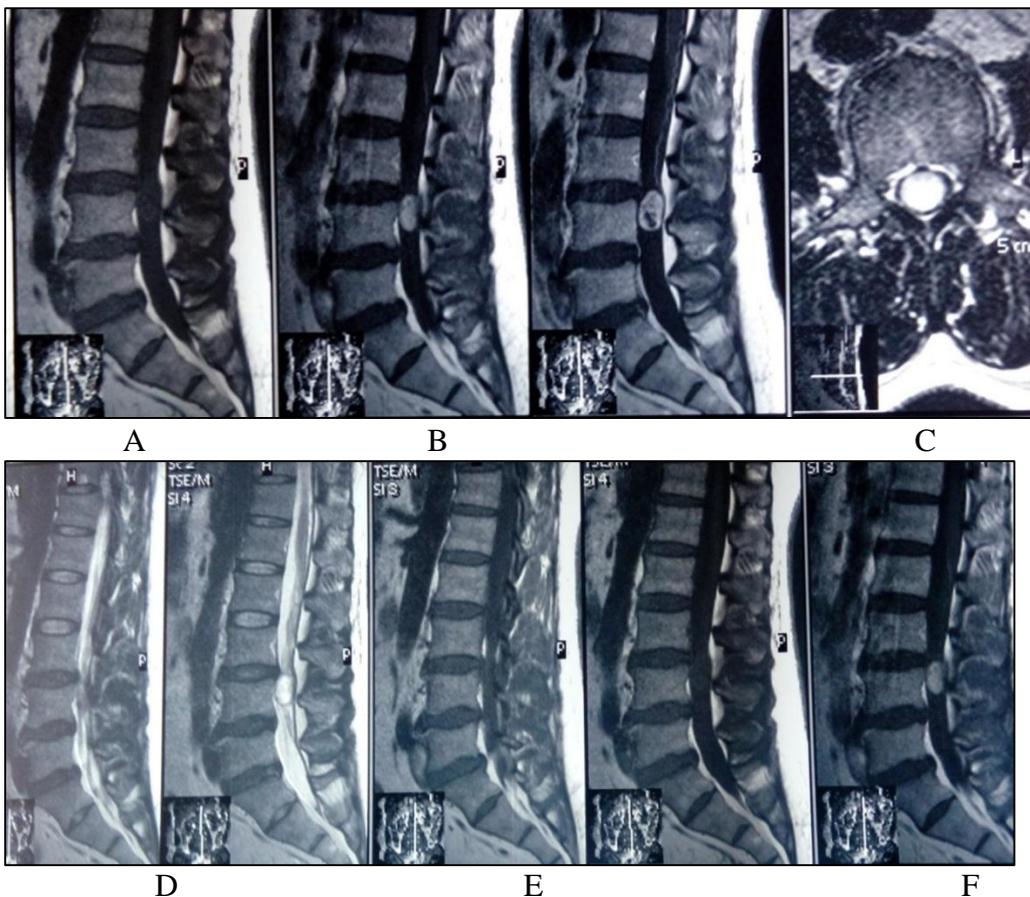


Figure 11: LSS MRI of intraspinal mass (A and E). sagittal T1 WI, (B) and (F) sagittal T1 WI with contrast enhancement , (C) axial T2, (D) sagittal T2 ,there is oval shape intradural mass at level of L4 vertebra show T1 hypointense SI , T2 hyperintense SI , T1+ contrast show heterogenous contrast enhancement.



Figure 12: LSS MRI of sacral bone lesion. Middle age male MRI study. **A.** sagittal T1 WI, **B.** sagittal fat suppression WI There is heterogenous destructive lesion involve sacral segments, CT scan was recommended for this lesion.



Fig. (13)

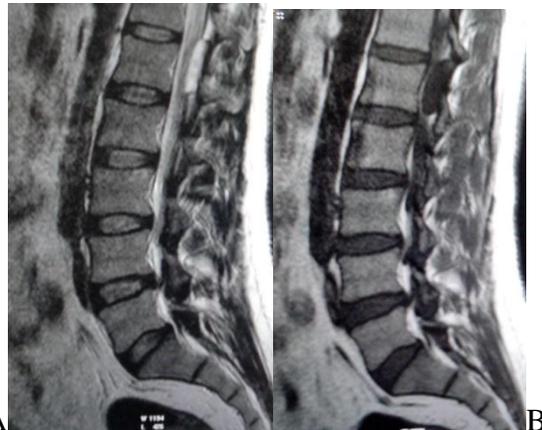


Fig.(14)

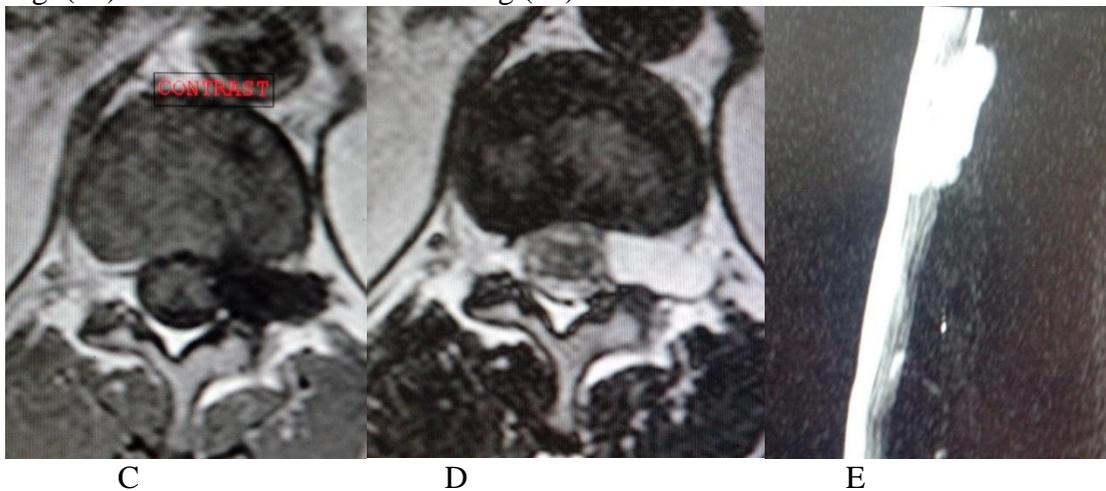


Figure 13: bone enostosis sagittal T1, well defined hypointense lesion at L2 vertebral body.

Figure 14: Arachnoid cyst(A). sagittal T2, (B) sagittal T1, (C) axial T1, (D) axial T2, (E)myelogram study. There is well defined extradural CSF intensity lesion at level L1 vertebra.

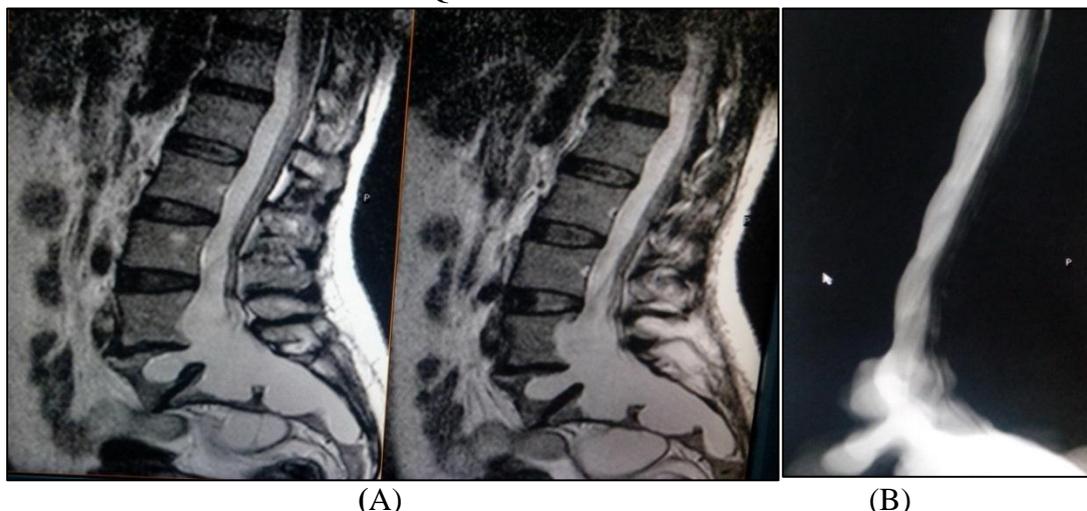


Figure 15: 42 year old woman with meningocele .(A)Sagittal T2, (B) Myelogram study. There is multiloculated CSF intensity cystic outpouching from thecal sac extend into pelvic cavity.

Discussion

Incidental finding range from benign normal body variation to more important pathological threatening issues [2] which can seriously change the treatment options or affect the quality of patient life [9]. In our study sample size was (805 patients), female [(460/805) (57.1%)], males [(345/805)(42.9%)], F:M = (1.3:1), these values agreed with almost all of other studies which found that females number exceeds males in LSS MRI, this may due to multiple undefined symptoms in females and higher examination requests in females. Park et al [7] study included total 1268 patients, males form [421(33%)], females [847(67%)], Quattrocchi et al [1] study population was 3000, males [1453 (48.4%)] and [1547(51.6%)] females, Tuncel et al [8] studied total patients (1278), of them [485 (37.9%)] were males and [793 (62.1%)] were females, Sobhan, Sami, Asgari and Ahmadi [2] investigated 444 patients with discopathy, [215 males (48.4%)]and [229 (51.6%) females].

Our population age range was (18-90 years) formed by adult patients. Quattrocchi et al [1] and Tuncel et al [8] studies age range were (16-91 years), Sobhan M. et al [2]. Age range (13 to 87) years which also found more number of lumbar spine examination seen in 30-60 age group which similar to what is seen in our study, this due to more work load on this age range being more active and more prone to discopathy. Age groups distributions in our study was into six groups (18-29) years (86/805), (30-40) years (183/805), (41-50) years (255/805), (51-60 years) (169/805), (61-70) years (98 patients) and >71 years (14 patients).

park et al [7] age group distribution divided into ≤ 29 years (70/1268), 30-49 y (328/1268), 50-69y (597/1268) patients, ≥ 70 years (273/1268), <50 years (398/1268), ≥ 50 years (870/1268) Sobhan, Sami, Asgari and Ahmadi [2], make slightly different classification dividing 444 into three age groups: younger than 30 were (106/444), 30-60 years were (285/444) and patients older than 60 constitute (53/444).

IFs detected in 275 patients out of total examined patients 805 (34.1%). This percentage is slightly higher than literature this due to inclusion of intra and extra spinal incidental finding in our visualized FOV of examined MRI studies and inclusion of female minor finding like nabothian cysts. Park et al [7] detected incidental finding of spine in 8.4 % of examined patients here extraspinal finding is not included, while Quattrocchi et al [1] found extraspinal findings in 68.6 % of patients by structured approach, using (C-RADS) CT Colonoscopy Reporting and Data System classification and their higher incidence may also related to large sample of 3000 patients. Dilli et al [9].found incidental findings in 19% of studied patients they study extraspinal IFs only, Tuncel et al [8].reported extraspinal IFs to be 19.8 % this is lower than our results this due to searching for extra spinal finding only, Sobhan et al [2].found IFs in 16 % out of total patients, he studied spinal and extraspinal finding and their population wall less than our sample volume, they examine 444 patients.

Age group (41-50) years show the highest number of detected IFs; this appears similar in

other literature, due to highest number of MRI request in this age group. Park et al [7] also found more IF in 30-49 years age group. Sobhan et al [2] detected more IFs in 30-59 years age group, which also saw that there is significant correlation between IF and age of patient with P-value 0.006, our study found P-value to be 0.001 regarding Incidental finding in relation to age.

Total incidental finding was (275 /805) 34% , male (90/275) , female (185 /275) , more IFs seen in females, there is significant correlation between incidence of it in relation to patient sex (< P- value 0.001) , Sobhan M et al. (2016) found that there is no significant correlation between frequency distribution of IFs in term of sex[2]this could be due to their sample size is smaller than our sample their study sample was 444 patients in our study we examined 805 patients.

Of total number of 275 patients with IFs, 259/275 patients (94.2%) with single incidental findings , and 14/275 patients (5.1%) have two incidental finding And 2/275 patients (0.72 %) have three incidental findings they were two females both had vertebral haemangioma with tarlov and nabothian cysts, Tuncel S. A. et al. (2015) state that about (5%) of patients with IFs had more than one IFs this agreed with our results [8].

Haemangioma is common blood vessel malformation within vertebral body, usually intraosseous, may have epidural extension[. Haemangioma is asymptomatic but in 1% of cases it is can cause symptom due to cord compression or compression fracture [10] haematoma or anomalous vessel [11]. It constitute largest number of IFs seen in our study, it is seen in [220/805 (27%)] total incidence, Barsin and Maleki state frequency (10-27%) in autopsy reports [12]., while park et al. [7] found haemangioma (1.5%) of examined patients, Sobhan et al [2] reported frequency of haemangioma 9.5% patient, our study show haemangioma more frequent in females 141/805 (17.5%) 30.6% of IFs in female population, in male its seen in 79/805(9.8%), 22.9 % in male population, the females: males ratio=1.3:1. Barsin and Maleki [12] also found it more predominant in females 3:2 female to male ratio , our study also found that it is more frequent in older population 41-60 years age group being highest incidence rate this agreed with previous

literature as reported by sobhan et al [2] with higher occurrence in 30-59 years group. Our study found 114 of total 220 (51.8%) haemangioma to be single and 106/220 (48.2%) multiple haemangioma, literature state 20-30% multiple haemangioma [10], Kalina [11] reported single level affection is much more common than multiple levels involvement, Sobhan et al [2] found single vertebral haemangioma in 7% and multiple levels vertebra affection in 2.5%.

Tarlov cyst is other name is perineural cyst of sacrum, it arise in neural foramina or spinal canal, it cause remodeling of bone, not enhanced on contrast, appear as simple fluid by all sequences [10]. It had prevalence rate between 1.5 – 4.6% among adults, it may cause symptom by pressure, radicular pain, bladder symptom and sexual dysfunction [13]. In Our study Tarlov cyst form 2.7% of total IFs, 21/275, 18/21 (86%) female and 3/21 (14%) in male, Park et al found its frequency 2.1% with more numbers in females 16/27, and 11/27 in males [7] this agreed with our results.

Perineural cyst is focal dilatation of neural foramen forming perineural root sleeve cyst may also defined as dilatation of Arachnoid and Dura of spinal posterior nerve root sheath containing nerve fiber, it is most common in lower lumbar and sacral spine [10]. Majority of these cysts are asymptomatic, but may exert pressure on adjacent nerve roots and cause pain, sensory dysfunction or weakness [2]. We detect 6/275 (0.74%), it is seen more frequently in females 4/6 (67%) and 2/6 (33%) in males, literature record 4.6-9% in adult, with age affected 30-40 y, and equal F:M ratio [10]. Sobhan *et al* [2] reported 0.7% incidence this mimic our rate

Renal cyst, on MRI it appear as well defined cyst contain fluid, T1 homogenous hypointense on T2 homogenous hyper intense, it may develop complication as hemorrhage and infection, calcification, septation, thick wall and appear like cystic tumors [3]. We found [4/275(0.5%), 3/4 (75%)] in females and [1/4 (25%) in males], one patient was with multiple cysts and two patients had large cysts 50 x 60 mm in diameter. Sobhan et al [2] study reported (2.9 %) incidence and Dilli et al found renal cysts in (6.2%) [9], Quattrocchi et al detect 35.5% [1]. Tuncel et al [8] found renal cyst incidence to be 6.4 %. Our incidence is lower than other studies this could be due to small

renal cysts not included in study and relatively smaller sample size we study 805 patients, tuncel sample volume 1278 patient, Quattrocchi et al [1] population were 3000 patients.

Ovarian Cyst occur mostly in premenopausal females, it appear on T1 WI as low – intermediate signal intensity , on T2 WI it show high signal intensity due to fluid content, most of ovarian cysts are simple follicles, in post-menopausal women ovarian cyst need further work up to exclude malignancy[3].seven ovarian cysts 7/275 (0.87%) incidence rate. Dilli literature found ovarian cysts in 2.7% [9] and Quattrocchi et al detected 10.7% [1]. Tuncel et al, 2.1 % [8]. The sizes of our detected cyst were 30-40 mm in diameter, with one of 40 x 58 mm in diameter in young female, smaller detection may be due to smaller sample size.

Solid uterine masses mostly being leiomyoma are common and appear as well defined, homogenous low signal on T2 WI [3]. Three cases of solid uterine masses seen 3/275 (0.37%) two of them seen in 41-50 age groups and the other in 61-70 age group All of them less than 50 mm in diameter. Quattrocchi et al. Study report solid benign lesion 10.6% [1] and Dilli found 3.1% fibroid [9], Tuncel et al rate was 3.1% [8] our study reported less number may be due to higher population number in other studies.

Regarding Nabothian cyst, most common benign cervical lesion, it had thin wall show isointense or hyperintense signal intensity on T1 images, and on T2 WI it is hyper intense [3]. We found It in [4/805 (0.5%)] females, one detected in (30-40) years age group , two in 41-50 years age group and other in 51-60 years group. Quattrocchi et al reported incidence (5.7%) [1]. This higher percentage may be due to larger sample size (3000 patients), Dilli found nabothian cysts in (1.3%) [9]. This difference may be explained by higher the female percentage in their study than our study (65 %), our female percentage was (57.1%).

Regarding intraspinal masses, Quiles et al study intraspinal lesions observed inside spinal canal, they found it was arise from spinal cord, filumterminale, root nerves, meningeal layers, vessels or vertebral bodies. Intra spinal masses form (15%) of craniospinal tumors, most common to be schwannoma (24%), metastasis (21%), meningioma (16.5%) or ependymoma (7%) [14]. In our study, four intraspinal masses

have been seen [4/805 (0.5%). 3/4 (75%)] in females and 1/4 (25%) in males. All cases present with non-specific back pain. However final diagnosis of these cases needed other investigation with biopsy in most of cases.

Three bone lesion were visualized 3/275 (0.37%), age group was 41-50 y for sacral osteolytic lesion and biopsy was recommended for final diagnosis. Other two cases were Bone island seen in 60-71 years old patients, these asymptomatic focal areas of bony sclerosis, It is congenital or developmental failure of bone resorption, and reassuring when there is no destruction, no soft tissue mass with its hypointense character [10]. References give 14 % spinal incidence of bone island with F=M ratio [15]. We studied LSS vertebra only this explain lower incidence.

Kadono et al stated that arachnoid cyst form 1% of all spinal space occupying lesions [16]. Extradural arachnoid cyst is rare cause of spinal compression, Rahimizadeh et al mentioned it in literature as single case or two to three case reports, this mean it is rare, more frequent in men, seen in mid thoracic or thoracolumbar junction [17]. In our study, two cases of spinal arachnoid cysts seen in upper lumbar spine levels in two male. It is small CSF intensity cystic lesion in spinal canal it follow CSF in all sequences, it may exert pressure on neural foramina and cause symptom. Our study detected 2/805 0.25% incidence.

First description of meningocele by Bryant in 1937 [18]. It is more common in woman usually present before third decade. Neurological symptom is rare but it may cause obstetric problem, sepsis, meningitis, bowel and bladder dysfunction. It is congenital multi or uniloculated extension of Dura and Arachnoid matter out of spinal sacral canal through anterior or anterolateral sacral defect [19], variable in size, mainly 2-4 vertebral bodies, well defined. CSF intensity, not enhanced, it may cause pain, parasthesia and incontenince [10]. Park et al [7] found sacral menigocele in 0.8 % of cases, in our study is seen in one female patient 42 years old [(1/805)0.125%] of total IFs, she was complaining from non-specific lower back pain this may be due to larger sample size in their study 1268 patients, our population were 805 patients.

Conclusion

There were significant difference in occurrence of these findings in regard to patient age and sex. Radiologist should be familiar with these findings. Most incidental findings had minor significance although great care should be paid in assessment of spinal and extraspinal structure to avoid missing clinically significant incidental findings. Providing information on prevalence of these findings help to manage and deal with them. Incidental finding should be recorded in patients reports because it can affect patient life and give additional information regarding patient health.

Acknowledgments

Author would like to thank University of Babylon and college of medicine and all colleagues in department of diagnostic radiology. Thanks also go to all staff in MRI unit in Al-Hilla teaching hospital and center of rehabilitation.

References

1. Quattrocchi CC, Giona A, Di Martino AC, Errante Y, Scarciolla L, Mallio CA, et al. Extraspinal incidental findings at lumbar spine MRI in the general population: a large cohort study. *Insights Imaging* (2013) 4:301
2. Sobhan M, Samiee M, Asgari Y, Ahmadi M. Incidental Findings of the Lumbar Spine at MRI in Patients Diagnosed with Discopathy. *Int J Medical Imaging* 2016; 4(5): 45
3. KamathS Jain N, Goyal N, Mansour R, Mukherjee K. Incidental finding on MRI of the spine. *Clinical Radiology* (2009)64:354.
4. Maizlin ZV, Barnard SA, Gourlay WA, et al. Economic and ethical impact of extrarenal findings on potential living kidney donor assessment with computed tomography angiography. *TransplInt* 2007; 20:338e42.
5. Brown S D. Professional Norms Regarding How Radiologists Handle Incidental Findings, *J Am Coll Radiol* 2013;10: 256 .. 253-257.
6. Eun SS, Lee HY, Lee SH, Kim KH, Liu WC. MRI versus CT for the diagnosis of lumbar spinal stenosis. *J Neuroradiol.* 2012; 39 (2): 104-9.
7. Park H J , Jeon Y H , Rho M H , Lee E J , Park N H , Park S I , Jo H J. Incidental Findings of the Lumbar Spine at MRI During Herniated Intervertebral Disk Disease Evaluation. *AJR* 2011; 196:1151–1155
8. Tuncel S A, Çağlı B, Tekatas A, Kırıcı MY, Ünlü E, Gençhellaç H. Extraspinal Incidental Findings on Routine MRI of Lumbar Spine: Prevalence and Reporting Rates in 1278 Patients. *Korean J Radiol* 2015;16(4):866-873
9. Dilli A, Ayaz UY, Turanlı S, Saltas H, Karabacak OR, Damar C, Hekimoglu B. Incidental extraspinal findings on magnetic resonance imaging of intervertebral discs. *Arch Med Sci* 2014; 10, 4: 757–763
10. Ross J S, Moore K R. *Diagnostic imaging :spine* 3rd edition .Elsevier, 2015 .Section 1: page 5, 702, 704,717, 843, 44, 45 ,837, 838, 121
11. Kalina P. Spinal Cord Compression by Thoracic Vertebral Hemangioma—A Case Report; *Open Journal of Medical Imaging*, 2012, 2, 29-31
12. Barzin M, Maleki I. Incidence of vertebral hemangioma on spinal magnetic resonance imaging in Northern Iran. *Pak J Biol Sci.* 2009; 12 (6): 542-4.
13. Cormac O. Maher, Joseph H. Piatt Jr. Incidental Findings on Brain and Spine maging in Children. April 2015. *PEDIATRICS*; Volume 135, number 4:1086, 1088
14. Quiles A. M., Roselló E. G, Laguillo G., García R., Caro J.-L., Pérez F., Pedraza GIRONA S.; /ES.A Comprehensive Review of Intraspinal tumors: Diagnostic, classification and radio-pathologic correlation. *European Society of radiology/ www.myESR.org*
15. Mugerá C et al: Sclerotic lesions of the spine: MRI assessment. *J Magn Reson Imaging.* 38(6): 1310-24, 2013
16. Kadono Y, Yuguchi T, Ohnishi Y, Iwatsuki K, Yoshimine T. *Case Report* A Symptomatic Spinal Extradural Arachnoid Cyst with Lumbar Disc Herniation. *Case Reports in Orthopedics*, Volume 2015, Article ID 250710, 5 pages
17. Rahimizadeh A., Kaghazchi M., Shariati M., Abdolkhani E., Abbasnejad E., RahimizadehS. spinal extradural arachnoid cysts; *Coluna/ Columna.* 2013; 12(2): 112-8
18. Bryant T (1837) Case of deficiency of the anterior part of the sacrum with athecal sac in the pelvis similar to the tumour of spina bifida. *Lancet* 1: 358.
19. Iyengar SN, Shukla A., Singh A. Raj S. Large Anterior Lumbar-Sacral Meningocele; *J Spine* 2013, *Degenerative Spinal Disorders*, S2:1-2.