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# STUDY OF LUMBAR CANAL STENOSIS AND THEIR COMPLICATIONS USING CONVENTIONAL MYELOGRAPHY VERSES CT MYELOGRAPHY

Medical Science

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## ABSTRACT

**Introduction**: By weighing the advantages and disadvantages, it will be possible for one to plan the investigations in the victims with symptoms ranging from low backache to, low backache with bladder involvement which will prove to be specific and cost effective instead of subjecting the victims to multiple investigations. With this in mind the present study- comparative study conventional versus CT myelography in lumbar stenosis lesions was undertaken. AP diam. Less than 12 mm is considered canal stenosis , while less than 10 mm is considered absolute canal stenosis.

**Materials and Methods:** The present study included 80 patients who clinically presented with complains ranging from low backache to paraplegia, with or without bladder involvement and who were clinically considered to have compressive myelopathy. All the above patients were subjected to conventional myelographic evaluation. Then the patient was subjected to CT scan evaluation of the lumbar spine by taking sequential sections on Spiral CT Scan unit.

**Results:** On Con myelography, 31 patients were thought to have single disc involvement, but in 3 out of 31 were detected to have L5-S1 disc involvement on CTM which were missed on Con. myelo

**Conclusion :** CT myelography proved to be far superior to conventional myelography as dimensions of the canal can be correctly measured. Hypertrophy of ligamentum flavum can be assessed. Involvement of apophyseal joints can be better noted. Assessment of the epidural fat can be better, done on CT myelography than on conventional myelography.

## KEYWORDS:

### Introduction

The syndrome of low backache with or without neurological deficit is a common diagnostic problem an orthopedic surgeon faces in daily practice. Such patients initially are treated conservatively with analgesics, short wave diathermy, tractions and exercises. Such patients attend the OPD with a variety of presentations and localization of lesion is too difficult at times. Such patients are subjected to lumbar myelography.

The compressive lumbar myelopathies are resultant of multiple causes ranging from simple osteophytic growths to metastatic lesions.

Initial anatomical dimensions of spinal canal also play a great role especially in presenting patient with specific symptoms. Roomy lumbar canal may keep the lesion hidden for a long time, whereas, a congenital narrow canal may bring the patient of compressive myelopathy in a very early stage. AP diam. Of lumbar spinal canal Less than 12 mm is considered canal stenosis , while less than 10 mm is considered absolute canal stenosis.Typical lumbar canal stenosis could be quite a frequent problem than we assume. It goes unnoticed or undetected many times. It affects general public in varying proportions starting from mid life (3rd- 4th decade) with maximum surge exhibiting from around 60 yrs. Cause of its unnotice / non detection earlier is, wide range of symptoms associated in this condition mimic other common issues involving lumbar region. Classical symptom of canal stenosis shows range from simple backache to pain in lower extremity worsening on standing or walking (relieved on sitting down or forward bending). Pseudoclaudication is the key symptom. Fatigue, heaviness in lower extremity , tingling or pricking or numbness and leg cramps come latter as symptoms. In latter stage bladder symptoms also may be seen in small % of cases. Male preponderance and peak cases near 60 years of age are well observed in canal stenosis, hence detection in earlier stage may help in prompt surgical management thus preventing irreversible damage.

The compression of the cord or nerve roots in lumbar region may present with simple pain or may result into an irreversible damage. It is therefore very important to promptly detect and locate the cause of compression of the cord or nerve roots in lumbar region. Lumbar spinal canal Antero-posterior diameter is measured .

The facility for examining the patient by CT scanner being available in the Institute, the study was taken for comparing the results of the routine conventional myelography with the myelographic CT evaluation of the patients presenting with compressive myelo/ neuropathies.

By weighing the advantages and disadvantages, it will be possible for one to plan the investigations in the victims with symptoms ranging from low backache to, low backache with bladder involvement which will prove to be specific and cost effective instead of subjecting the victims to multiple investigations. With this in mind the present study "Comparative study conventional versus CT myelography in lumbar lesions" was undertaken. AP diam. Less than 12 mm is considered canal stenosis , while less than 10 mm is considered absolute canal stenosis.

### Materials and Methods

The present study included 80 patients who clinically presented with symptoms ranging from low backache to, paraplegia, with or without bladder involvement and who were clinically considered to have compressive myelopathy. All the above patients were subjected to conventional myelographic evaluation.

Detail clinical evaluation by noting the presentation of the patient's clinical examination, past history, and family history. CNS evaluation was performed in detail by evaluating sensory and motor systems. Bladder and/or bowel involvement was noted. Plain radiography of lumbar vertebral column was studied by carrying out antero-posterior and lateral views and if needed oblique views of lumbar spine were taken. In some cases the radiographs available with the patients were reviewed to avoid extra-radiation to the patient. Radiography was carried out on Siemens 500mA X-ray unit on 12"x15"or 10"x12" size x-ray films. Wherein Kv ranging from 70 to 90 and MAs ranging from 80-125 depending on the thickness of the part of the patient to be examined, were applied. Bucky radiography with the tube distance of 100cms was used as the fixed parameters Myelographic evaluation - The referred patients were advised the preparation for the abdomen. On prior day, at the time of giving the appointment for myelography patients were also evaluated by Ophthalmologist for signs of raised intra-cranial tension.

On the day of examination, valid consent of the patient was taken. Blood pressure, pulse, status of hydration and sensitivity to the contrast were noted. Myelography was done under all aseptic precautions by doing lumbar puncture at L 2-3 or L3-4 level and using 8-10m1 of Inj.

Omnipaque (300mg Iodine/m1). Then the patient was subjected to CT scan evaluation of the lumbar spine by taking sequential sections on Spiral CT Scan unit ( Somatome Plus 4-A -Siemens make).

The CT scan examination of the lumbar spine (L -S) was performed by selecting 5mm thickness of a slices with 5mm feed. If required, slice thickness was reduced to 3mm. The gantry tilt was planned according to the level of lesion. Post processing of the images was done by using 3-D functions i.e. Multi-Planner Reconstruction (MPR) and Shaded Surface Display (SSD). The examination covered the adjoining area of the level of lesion, for example lower thoracic evaluation was carried out when the level of lesion was at L 1 .The images were documented by using the KODAK Laser Camera by observing the protocol of 20 or 25 cuts on one film (14" x 17") and in different windows.

After the myelographic and CT evaluation procedure were over the patient was hospitalized under the clinician's care for post-myelogr aphy observation. The data collection was done and analysed using appropriate statistical method .

**Table No. 1 Observations regarding lumbar canal stenosis**

| Age (years) | Male | Female | Total |
|---|---|---|---|
| < 10 | 0 | 0 | 0 |
| 11 – 20 | 1 | 0 | 1 |
| 21 -30 | 3 | 0 | 3 |
| 31 – 40 | 4 | 2 | 6 |
| 41 – 50 | 1 | 2 | 3 |
| 51 – 60 | 2 | 1 | 3 |
| 61 – 70 | 0 | 0 | 0 |
| 71 – 80 | 0 | 0 | 0 |
| > 80 | 0 | 0 | 0 |
| Total | 11 | 5 | 16 |

**Table No. 2 Radiological features in 16 patients presenting with lumbar canal stenosis and their complications between conventional myelo and CT myelographic evaluation**

| Radiological features | No. of cases | Detected on | | Remarks |
|---|---|---|---|---|
| | | Con. Myelo | CT Myelo | |
| Decreased sagittal and transverse diameter | 16 | 15 | 16 | CTM better |
| Flattened thecal sac anteroposteriorly | 12 | 10 | 12 | CTM sensitive |
| Hypertrophic inter-vertebral joints | 5 | 3 | 5 | CTM better |
| Scarsity of epidural fat at inter-vertebral disc level | 3 | 1 | 3 | CTM sensitive |
| Ligamentum flavum hypertrophy | 3 | - | 3 | CTM is sensitive & specific |
| Lateral rececess depth <4mm | 2 | - | 2 | CTM specific very specific |

## LUNBAR CANAL STENOSIS

Lumbar canal stenosis may be congenital or required or mixed, may be bony or soft tissue. In the present study, there were 16 patients of canal stenosis of 80 examined.

Maximum number of patients i.e. 6 were from the age group ranging between 31-40 years, 3 were in between 21-30 years, 3 between 41-50 years and 3 between 51-60 years. Only one case was detected in 11-20 years age group. It is therefore observed that, the patients of lumbar canal stenosis commonly present in middle age. Degenerative changes which encroach upon the canal, which is already narrow, makes the patient present in middle age.

Male preponderance was seen in the present study (male-11 and female-5). Similar observations are noted by Robert H Dorwet et al. [34]

The radiological features were picked up in 100% of patients on CT myelography as against the less sensitivity of detection on conventional myelography.

16 patients detected to have decreased sagittal and transverse diameter on CT myelography, but same could be appreciated only in 15 patients on conventional myelography. CT myelography revealed 12 patients to have flattened thecal sac antero-posteriorly as against it was possible only in 10 patients on conventional myelography. CT myelography detected hypertrophic inter-vertebral joints in 5 patients while only 3 were detected on conventional myelography. Scarcity of epidural fat at inter-vertebral disc level was appreciated in 3 patients on CT myelography as against only one on conventional myelography.

The hypertrophy of ligamentum flavum and appreciation of decrease in depth of lateral recess to less' than 4mm could be observed only on CT myelography and not on conventional myelography.

The observations in the present series reveal that, CT myelography stands superior to conventional with high sensitivity and specificity over conventional myelography.

It was the second large group having lumbar lesion. Commonest age group of presentation was 4th decade followed by 3rd decade. Male preponderance was seen. CT myelography proved to be far superior to conventional myelography as dimensions of the canal can be correctly measured. Hypertrophy of ligamentum flavum can be assessed. Involvement of apophyseal joints can be better noted. Assessment of the epidural fat can be better, done on CT myelography than on conventional myelography.

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