



A Case Series on Comparative Study of Functional and Radiological Outcome of Single Cage Vs Double Cage Fixation with Posterior Lumbar Interbody Fusion in Atraumatic Spine Cases

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KEYWORDS

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Diseases

ABSTRACT:

Lumbar spine diseases is most common condition presents with lower backache with radiating pain with or without neurological deficits. Mostly this diseases will have better outcome conservative modalities of treatment but surgery is needed when there is progressive disease even with conservative management. This is a prospective study, includes 20 patients (10 single cage and 10 double cage fixation with posterior lumbar interbody fusion). The patients were assessed preoperative and post operatively with prolo score , and radiological tools. The study was carried out for 1 year. At the end of 1 year we found that patients with double cage fixation has better functional and radiological outcome in terms of prolo score assessment and radiological evaluation for cage subsidence respectively as compared to single cage fixation as the later had development of symptoms on contralateral side in few patients and few had cage subsidence at post operative period.

LEARNING POINT – Double cage has better functional and radiological outcome in terms of cage subsidence and recurrence of symptoms on contralateral side as compared to single cage.

INTRODUCTION

Lumbar degenerative disease is a major cause of intractable low back and leg pain in middle-aged and older people. Interbody fusion is the standard surgical procedure for treating persistent neurological symptoms caused by lumbar degenerative disease when conservative treatment fails .Currently interbody fusion is mainly processed by cage implantation, which plays an important role in vertebral body fusion as a permanent implantation. Segment fusion with intradiscal cage and pedicle screw fixation is the “gold standard” treatment for lumbar disc hernia and degenerative intervertebral disease with lumbar canal stenosis. The purpose of this study is to compare the functional and radiological outcomes of single cage and double cage fixation with posterior lumbar interbody fusion

AIM AND OBJECTIVES

AIM:

Comparative study between radiological and functional outcome of single cage vs double cage fusion in lumbar disc diseases with posterior lumbar interbody fusion.

OBJECTIVES:

- 1.To assess the intervertebral disc prolapse by help of radiological investigations
- 2.To assess the functional outcome in patients with single cage vs double cage fixation with posterior lumbar interbody fusion

MATERIALS AND METHODS

This prospective study followed 20 patients over 12months at Sree Balaji Medical College and Hospital

INCLUSION CRITERIA

- Adults >18yrs
- Both male and female
- Non traumatic lumbar disc diseases with degenerative disc prolapse
- Lumbar canal stenosis
- Atraumatic Spondylolisthesis

EXCLUSION CRITERIA



- Age <18 years
- Medical contraindication for surgery
- Metastatic spine diseases
- Traumatic lumbar spine case
- Infection
- Inflammation

DATA COLLECTION

The study included 30 individuals with degenerative lumbar spinal stenosis, degenerative intervertebral disc prolapse, atraumatic spondylolisthesis. Informed consent was obtained and a systemic proforma was completed for each patient, including demographics, preoperative neurological evaluation, preoperative prolo scoring, radiological evaluation using xray lumbar spine and MRI for intervertebral disc, canal stenosis evaluation.

OPERATIVE TECHNIQUE

Surgeries were performed in a prone position under general anaesthesia. Prophylactic antibiotics were administered 30 minutes prior to incision. Level marking was done using CARM guidance. Midline incision was used for skin incision, soft tissue dissection was done, spinous process was removed along with laminectomy, dural sac was retracted, using intersection technique the pedicles screws are inserted followed by cage fixation after discectomy under CARM guidance. Post operatively the prolo scale was assessed at interval of 3months and compared with preoperative prolo score.

CASE 1(SINGLE CAGE FIXATION)

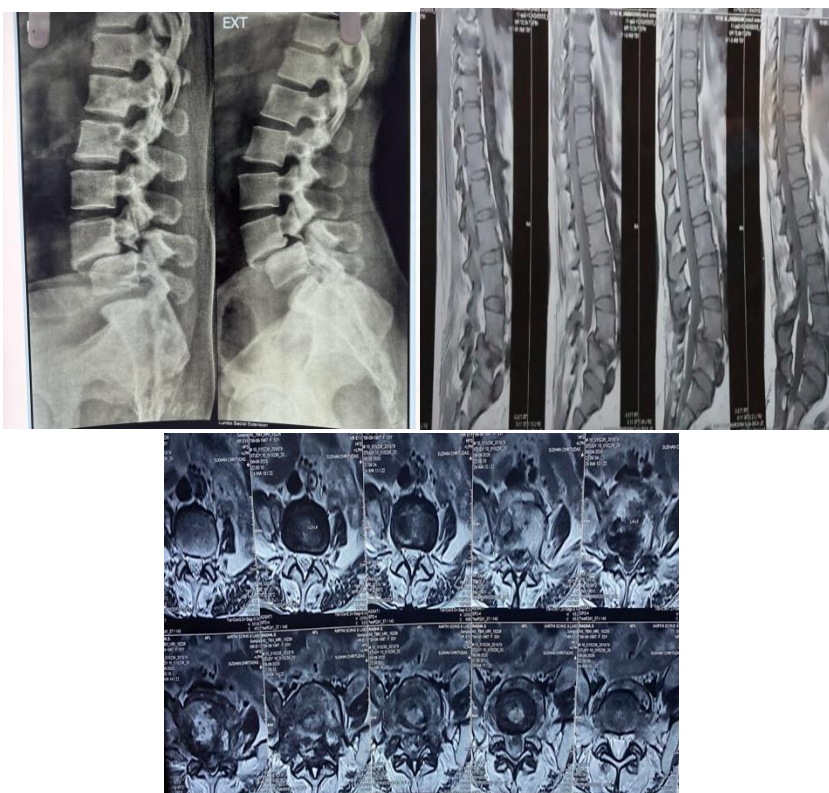


FIG – 1A, 1B, and 1C PREOPERATIVE XRAY AND MRI OF LUMBOSACRAL SPINE IN SAGGITAL AND AXIAL VIEW

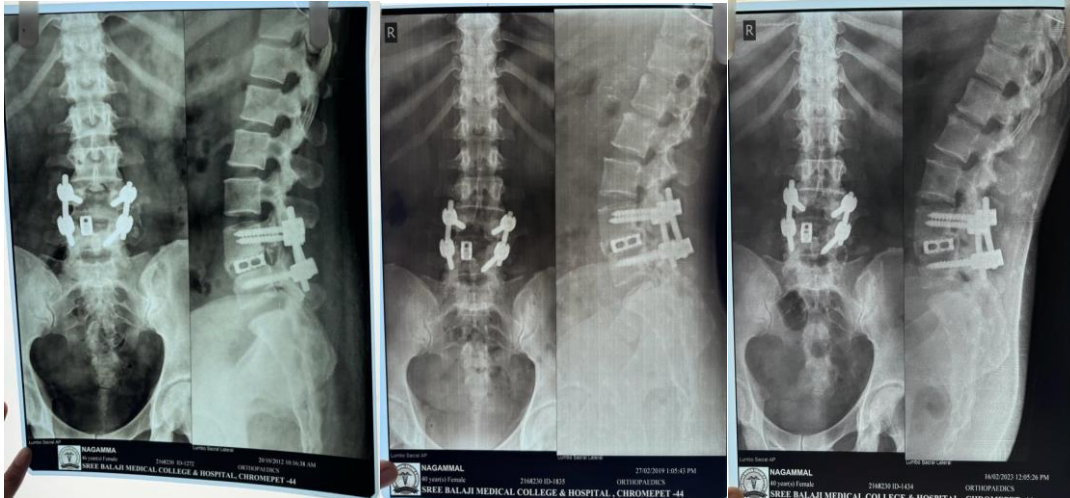


FIG- 2A IMMEDIATE POST OPERATIVE XRAY

FIG- 2B AT 6 MONTHS FOLLOWUP XRAY

FIG- 2C AT 1 YEAR FOLLOWUP XRAY



FIG- 3A and 3B RANGE OF MOVEMENTS POST OPERATIVE

CASE 2(SINGLE CAGE FIXATION)

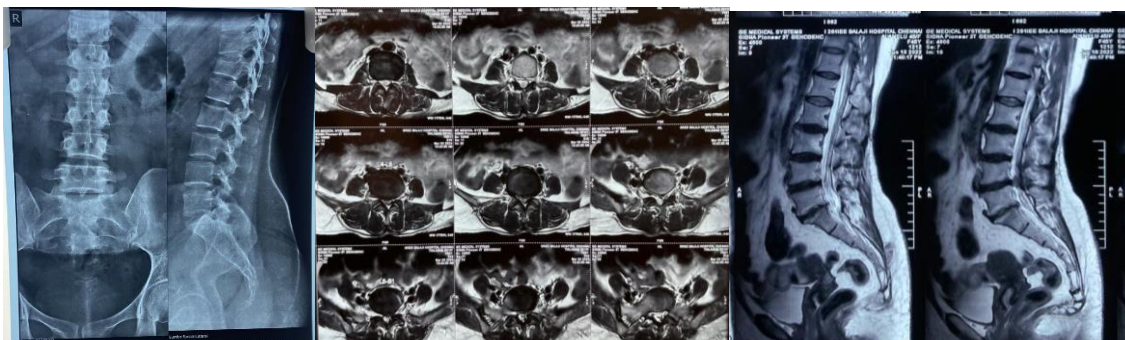


FIG- 4A, 4B, and 4C PREOPERATIVE XRAY AND MRI OF LUMBOSACRAL SPINE

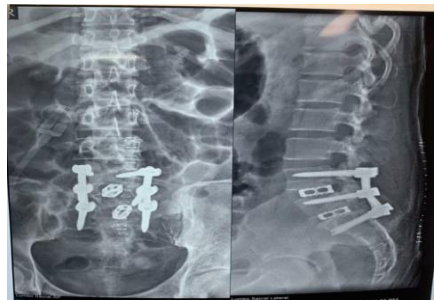


FIG- 5A, 5B, and 5C POST OPERATIVE XRAY AT IMMEDIATE , 6MONTHS FOLLOWUP AND AFTER 1 YEAR FOLLOWUP SHOWING CAGE SUBSIDENCE



FIG- 6A and 6B RANGE OF MOVEMENTS POST OPERATIVE PERIOD

CASE 3(DOUBLE CAGE FIXATION)

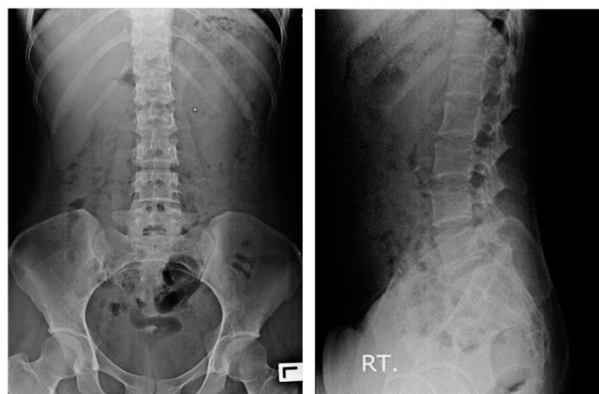


FIG – 7 PREOPERATIVE XRAY AP AND LATERAL VIEW



FIG- 8 SAGITTAL SECTION OF MRI

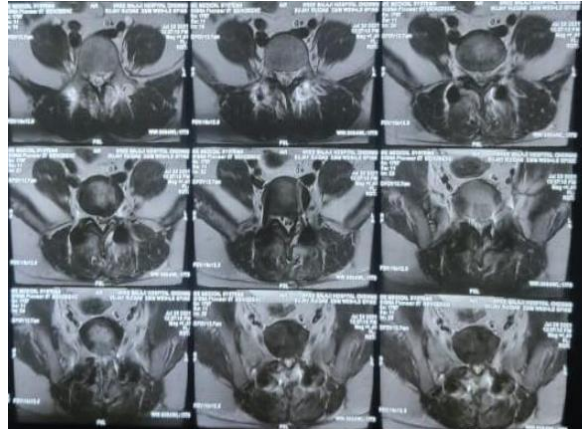


FIG- 9 AXIAL VIEW OF MRI



FIG – 10 IMMEDIATE POSTOPERATIVE XRAY



FIG- 11 6 MONTHS FOLLOWUP XRAY

FIG- 12 1 YEAR FOLLOW UP XRAY



FIG- 13 RANGE OF MOVEMENTS POSTOPERATIVELY

CASE 4 (DOUBLE CAGE FIXATION)



FIG- 14 PREOPERATIVE XRAY

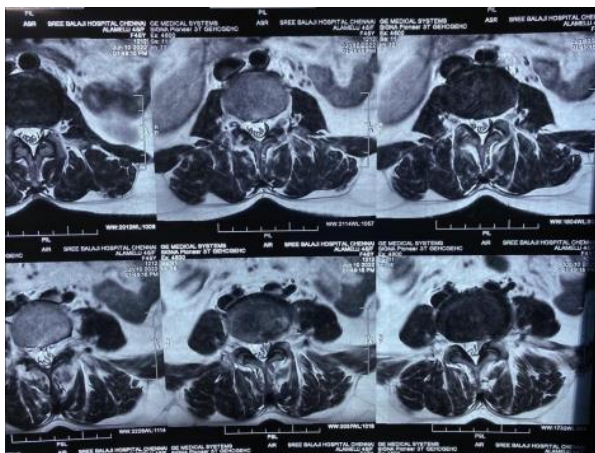


FIG- 15 PREOPERATIVE MRI AXIAL VIEW



FIG- 16 PREOPERATIVE MRI SAGGITAL VIEW

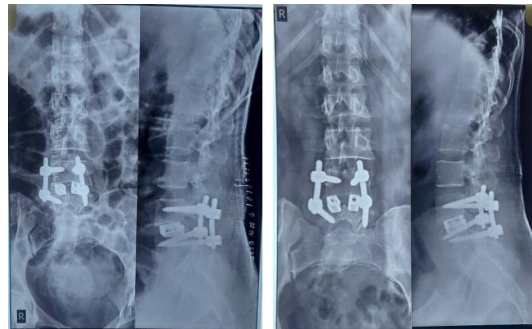


FIG-17 IMMEDIATE POST-OP

FIG-18 AFTER 6 MONTHS

XRAY



FIG- 19 AFTER 1 YEAR FOLLOW UP XRAY



FIG- 20 RANGE OF MOVEMENTS POST OPERATIVELY

PROLO

Status	Description
Economic (activity) grade	
1	Complete invalid (worse)
2	No gainful occupation (including housework or retirement activities)
3	Working/ active but not at premorbid level
4	Working/ active at previous level with limitation
5	Working/ active at previous level without limitation
Functional (pain) grade	
1	Total incapacity (worse)
2	Moderate to severe daily pain (no change)
3	Low level of daily pain (improved)
4	Occasional or episodic pain
5	No pain

FIG- 21 Shows prolo score



Table :1 Comparison of Pre – Op Prolo Score Between Groups:

Pre-Op Prolo Score	GROUP		TOTAL	CHI-SQUARE VALUE	P VALUE
	DOUBLE CAGE FIXATION	SINGLE CAGE FIXATION			
A	6 (40)	5 (33.3)	11 (36.7)	1.71	0.425
B	7 (46.7)	5 (33.3)	12 (40)		
C	2 (13.3)	5 (33.3)	7 (23.3)		
TOTAL	15 (100)	15 (100)	30 (100)		

Table : 2 Comparison of Post–surgical Prolo Score Btw Groups

Post-op PROLO Score	Group		Total	CHI-SQUARE VALUE	P VALUE
	Double cage fixation	Single cage fixation			
5-6	1 (6.7)	5 (33.3)	6 (20)	7.254	0.027*
7-8	4(26.7)	7(46.7)	11(36.7)		
9-10	10(66.7)	3(20)	13(43.3)		
Total	15(100)	15(100)	30(100)		

DISCUSSION

For past 1 year all the spine case follow up after single cage fixation has set of complications compared to double cage fixation

- A) RECURRENCE OF SYMPTOMS ON CONTRALATERAL SIDE
- B) ASYMMETRICAL HEIGHT OF VERTEBRAL BODY
- C) HIGH SUBSIDENCE OF CAGE
- D) INCREASED MECHANICAL STRESS OVER LUMBAR SPINE

From this prospective study of 20 participants we concluded that out 10 patients who underwent the single cage fixation 3 had asymmetrical disc space, 3 had developed symptoms on contralateral side post operatively ,2 had cage subsidence on radiological evaluation at post operative period. Out of 10patients underwent double cage none of the cases had developed similar symptoms on opposite side and cage subsidence radiologically.

CONCLUSION

Posterior lumbar interbody fusion plays a major role for the patients with lumbar spine diseases . When comparing the Post-Op Prolo score for acute or



degenerative IVDP cases, double cage fixation shows a better outcome when compared to single cage fixation. On postoperative assessment of operated cases (double cage and single cage) few Single cage cases had developed symptoms on operated site with radiculopathy, few cases had cage subsidence on radiological assessment. Double cage cases had no subsidence or reoccurrence of symptoms. This study had given deep insight about the functional outcome of double cage fixation and single age fixation of plif. Also only minimal study were there with regarding to the results of the posterior lumbar interbody fusion in terms of functionality. According to study we have concluded that double cage is better in elder patients with osteoporosis due to high stability and maintains disc height symmetrically.

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