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TRANSFORAMINAL LUMBAR INTERBODY FUSION (TLIF) WITH PEDICLE SCREW FIXATION- AN EFFECTIVE MODE OF TREATMENT OF LYTIC SPONDYLOLISTHESIS.

Orthopaedics

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ABSTRACT

Background : Spondylolisthesis is derived from the Greek words – spondyl (vertebra) and olisthesis (to slip). This describes the forward slippage of a cephalad vertebra on a caudal vertebra.Spondylolisthesis is one of the common cause for back ache and it might lead to various complications if not treated properly. There are various methods of treatment for spondylolisthesis. Our study is to emphasis that TLIF (TRANSFORAMINAL LUMBAR INTERBODY FUSION) is effective modality of treatment for spondylolisthesis. **Methods:**12 patients of Grade 1- 4 Meyerdingspondylolisthesis are studied , among which 8 are female and 4 are male. The study is conducted in Department of Orthopaedics at AlluriSitaramaraju academy of medical sciences from September 2018- September 2019 after approval from ethics comittee. All of them are operated by same surgeon and TLIF . **Results:** Patients were asked to review at frequent intervals after the discharge from hospital . At each visit patient is assessed by the by Oswestry Disability Index scoring system and radiographs of spine AP , Lateral views . Out of 12 cases we had 2 cases of superficial infection which were treated by antibiotics and one case of screw malposition which was revised . None of the patients returned with similar complaints . **Conclusion :** We conclude ,Transforaminal lumbar interbody fusion is a safe and effective procedure in producing pain relief besides causing less morbidity to the patient.It provides the benefit of a 360 degree fusion. High fusion rates are achieved with this technique with a good clinical outcomes and few complications.

KEYWORDS

Lytic spondylolisthesis,spine fusion, TLIF(TRANSFORAMINAL LUMBAR INTERBODY FUSION).

INTRODUCTION

Backache is one of the major orthopaedic problems encountered more and more these days. 1It accounts for major human disability and economic loss.2Spondylolisthesis is one of the major cause among them. Spondylolisthesis describes the forward slippage of a cephalad vertebra on a caudal vertebra. If not diagnosed early and treated properly Spondylolisthesis may lead to various complications like caudaequina syndrome, hamstring contracture and disturbed gait. There are various methods of treatment for lytic spondylolisthesis which include anterior lumbar interbody fusion(ALIF), Posterior lumbar inter body fusion (PLIF), TRANSFORAMINAL LUMBAR INTERBODY FUSION(TLIF).3,4Our study is to aimed to estimate the functional and radiological effectiveness of transforaminal lumbar interbody fusion (TLIF) with pedicle screw fixation in treating lytic Spondylolisthesis.

MATERIALS AND METHODS

Study design and sampling :

This clinical prospective study was conducted on 12pateintsoflytic spondylolisthesis operated with transforaminal lumbar interbody fusion (TLIF) in the department of orthopaedics, at AlluriSitaramaraju academy of medical sciences, Eluru , Andhra Pradesh from September 2018- September 2019. All of them are operated by same surgeon . Patients of age from 20-60years of Mayerdings5Grades 1-4 of lyticspondylolisthesis are included in the study. Grade 5 spondylolistheis, degenerative and traumatic listheis are excluded from the study . Patients with spinal tumours,deformities and who had previous surgeries are excluded from the study . Patients were explained the purpose of the study and an informed consent was obtained. Those refusing to consent were excluded from the study and their clinical management was not affected in any manner. The study was approved by the institutional ethics committee and was performed according to the bioethical guidelines prescribed by the Indian Council of Medical Research, New Delhi.

SURGICAL TECHNIQUE

After the administration of general anaesthesia, patient is placed in prone position on the c-arm compatible operating table, over the bolsters.A mid line incision is made centering on the involved vertebrae. The para spinal muscle dissection is done and the spinous process are exposed sub periosteally and exposure is carried out until the tip of the transverse process are exposed.Following exposure the rattle fragment is identified.Then laminectomy is carried out.

Under direct visualization and with the aid of image intensifier, pedicles of each vertebrae are identified.Then the pedicle entry is made with the sharp diamond shaped entry awl and pedicle is probed with the help of pedicle probe to verify the four walls of the pedicle.Then the pedicle is tapped and the pedicle screws of appropriate diameter and length are placed and connected to a lordotic pre countered rod and fixed with the top screw head.The pedicle screws are distracted so that it helps in reduction of the listhesis, maintaining the disc space and the nerve root becomes free.A 0.25 inch osteotome and kerrisonrongeurs are used to remove the entire inferior articular process and superior portion of the superior articular process on the side chosen for TLIF.A 15 number blade scalpel is used to create an annular window on the disc.Specialized straight and angled pituitary rongeurs, rasps and curettes are used to remove the disc material.The disc space is then irrigated with saline and then re-inspected to confirm complete removal of disc material.(Figure 1)

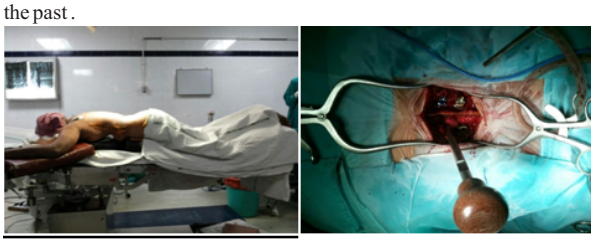
Now the end plates on both the sides are prepared by curetting them with ring and box curretts.Then the autograft bone obtained by laminectomy and fecetectomy is placed in the disc space along with cage .Wound wash is given with normal saline, no suction drain is placed and closed in layers by using. Post op x ray of X Ray LS spine AP and lateral views were taken(Figure 2) on POD 1 and assessed for placement of screw, graft and cage position and reduction of spondylolisthesis.Injectable antibiotics are given for 3 days. Patient was mobilized on 2ndpost operative day with appropriate size lumbo sacral corset.Suture removal was done on 12thpost operative day and discharged..Oral analgesics and and antibiotics were given for the next two weeks more.Patients were advised to come for follow up after two weeks.

Date collection : Patients were first seen in the OPD and clinical diagnosis of spondylolisthesis was made and confirmed radiologically.Functional assessment is done by Oswestry Disability Index scoring system.6Plain radiographs antero-posterior, lateral, flexion, extension and oblique views are obtained.The grade of listhesis and the slip angle are measured.Patients were evaluated Using a pre-designed case report form, demographic and clinical information was noted for all patients.Pateints were asked to come for regular followup at 2, 4, 6, 12 weeks, 6 months and one year .On each followup patients were assessed with Oswestry Disability Index scoring system6 and radiographs of spine AP , Lateral views at every visit . Criteria for bony fusion were 1) Anterior and posterior bony bridging 2) Bony continuity between the upper and lower endplates, 3)Trabecular structure in the anterior graft 4) The lack of radiolucent lines around the anterior graft. Results are rated as;fused (three criteria

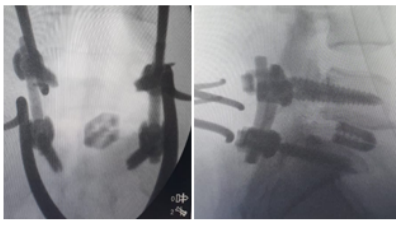
positive)probably fused (two criteria positive),probably not fused (one criterion positive)pseudarthrosis with loosening of the implants (evidence of radiolucent lines).

Statistical method :

Statistical methods used are percentages and proportions. Software used is Microsft XL 2019 version . All the data collected in this study and the analysis made were compared with the similar studies done in the past .



(A) (B)



(C)

Figure 1: (A) Patient positioning , (B) intra op picture (C) Intarop CARM images

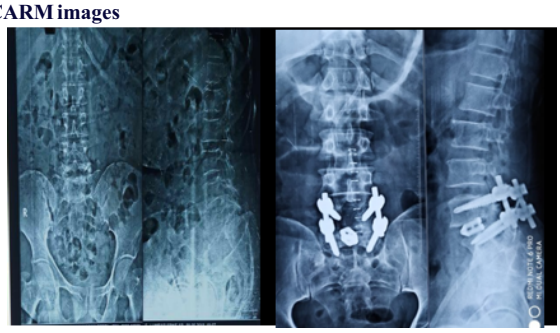


Figure 2:PRE OP AND POST OP X RAY

RESULTS & ANALYSIS

TABLE NO.1: AGE DISTRIBUTION

AGE IN YEARS	NO. OF CASES	PERCENTAGE
20-30	5	41.66%
31-40	6	50%
41-50	1	8.33%
51-60	0	-

From our results, we can see that majority of cases are between 20-30 years.

TABLE NO.2:SEX DISTRIBUTION

GENDER	No. of patients	Percentage
Male	4	33.3%
Female	8	66.6%

From our results we can observe that majority of cases are female.

TABLE N0.3:SYMPTOMATIC DISTRIBUTION

SYMPTOMATIC DISTRIBUTION	NO.OF PATIENTS	PERCENTAGE
BACK PAIN	5	41.66%
RADICULOPATHY	2	16.66%
NEUROLOGICAL DEFICITS	2	16.66%
NEUROLOGICAL CLAUDICATION	3	25%

The common symptom in our patients was back pain followed by radiculopathy.

TABLE NO.4:COMPLICATIONS

COMPLICATIONS	NO. OF PATIENTS	PERCENTAGE
NIL	9	75%
SUPERFICIAL WOUND INFECTION	2	16.66%
IMPLANT BREAKAGE	0	-
SCREW MALPOSITION	1	8.33%

Out of 12 patients we had 2 cases of superficial infection which were treated by antibiotics and one case of screw malposition which was revised . None of the patients returned with similar complaints.

DISCUSSION

Spondylolisthesis has many causes as classified by Wiltse.4Our study is focused on lytic group of Spondylolisthesis. There are several different techniques of lumbar fusion. Among those ALIF, PILF and more recently TILF. Both ALIF and PLIF approaches for lumbar spine have been reported to be associated with specific problems. ALIF procedure requires trans-retroperitoneal approach to spine. This is associated with risk of injury to major vessels and risk of retrograde ejaculation due to injury to superior hypogastic plexus and longer rehabilitation when performed in two stages.PILF procedures are at the risk of spinal cord damage during necessary retraction maneuvers. Post operativearachnopathy, peridural fibrosis and high rates of epidural blood loss are reported. Further more ,complete laminectomy may lead to instability of the upper adjacent level and it makes a posteromedial grafting impossible.

TILF represents an alternative surgical technique avoiding both anterior approach and approach through the spinal canal. Advantages of TILF are, it does not require nerve root retraction during the procedure and thus prevents scarring, provides bilateral anterior column support through a single approach to the disc space, it preserves the anterior and most of the posterior longitudinal ligament complex, which provides a tension band for retropulsion of the graft.

Comparing our results with similar studies in the past ,CODY.A.CHASTAIN Et AL in 20077 and QAYUM ET AL (N=9)8 , majority of patients presented with back pain in all the three studies. In our study 83.33% fusion rate was achieved, this is in comparison with Cody A. Chastain Et Al7 which has 64.1% andQayum ET AL8 which has 88.88%. In our study we had two cases of superficial infection and one case of screw malposition (25%). The previous studies showed only 11.9% patients with superficial infection in cody.a.chastain et al7 and 11.1% of patients in QAYUM ET AL[8] .

However this study has some limitations. Sample size was less and subjects were not randomized, as they were not selected from public at large.

CONCLUSION

Transforaminal lumbar interbody fusion is a safe and effective procedure in producing pain relief besides causing less morbidity to the patient.It provides bilateral anterior and posterior column support through an unilateral posterior approach.It also maintains the normal lumbar lordosis.It provides the benefit of a 360 degree fusion without performing an anterior approach.High fusion rates are achieved with this technique with a good clinical outcomes and few complications. Patients are mobilized quickly and resume their activities early.

DECLARATIONS

Funding: None
Conflict of interest: None
Ethical approval: The study was approved by the institutional ethics committee.

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