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Evaluation of the Results of Unilateral Pedicular Fixation and Interbody Fusion in Treatment of Degenerative Lumbar Disc Disease

Mahmoud AM Nafady, MD., Ahmed H Elsayed, MD., Hesham A El Saghir, MD., Yasser Allam, MD.

Orthopedic Surgery and Traumatology Departement, Faculty of Medicine, University of Alexandria

Abstract

Background data: Chronic discogenic back pain caused by degenerative disc disease is a common problem in general population. In clinical practice, lateral recess stenosis and foraminal stenosis may induce nerve root compression which can cause unilateral symptoms. Less invasive spinal fusion is performed by a unilateral approach, which may significantly minimize or diminish the iatrogenic soft tissue injury, the intra-operative blood loss, the postoperative pain and the duration of hospital stays.

Purpose: to evaluate the efficacy of PLIF and unilateral pedicle screw fixation in degenerative lumbar disc disease

Study Design: A prospective clinical case study.

Patient and Methods: This study was carried out on 30 patients (16 males and 14 females) with mean age of 40.35±9.82 years. All failed conservative treatment and had confirmed diagnosis radiologically. All underwent posterior lumbar decompression, interbody fusion with single oblique cage filled with local bone and unilateral pedicle screw fixation. Clinical assessment was done using Visual Analogue Scale (VAS) and ODI. Radiological assessment of fusion was done using BSF criteria. Patients were followed for 17.77±7.17 months postoperatively.

Results: According to ODI; 12 patients (40%) had excellent clinical results, 15 (50%) had good results, 3 (10%) had fair results. The mean VAS of leg pain improved from 6.80±1.37 to 2.17±0.91, where the VAS of back pain improved from 5.33±1.18 to 2.13±0.90 postoperative. All sensory and motor deficits cleared apart from 3 patients with mild leg paresthesia. Radiologically, 28 patients (93%) showed successful fusion at the end of the follow up period. Reported complications include, one (3.3%) wound infection, one (3.3) intra-operative dural tear, and two partial (grade 3) foot drop. There were two patients with pseudoarthrosis, although there was no case of implant failure or screw breakage.

Conclusion: Our data suggest that conducting PLIF using the diagonal insertion of a single cage with supplemental unilateral transpedicular screw instrumentation enables sufficient decompression and solid interbody fusion. (2017ESJ152)

Keyword: lumbar disc disease, unilateral fixation, lumbar fusion

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Introduction

Lumbar disc disorders are a tremendous clinical problem. However, the treatment of disc degeneration with or without herniation and the associated pain is controversial. Degenerated lumbar disc hernia is a disease process that needs more detailed study and understanding.[1] Opportunities to improve understanding at both basic science and clinical levels remain greater for disc disorders than for other clinical areas.[30] Lumbar disc prolapse (LDP) may present with low back pain which is exacerbated by certain activities, with or without radiculopathy.[19]

The majority of LDP can be treated conservatively. Surgical indications in the treatment of LDP are; cauda equina syndrome, progressive neurological deficit, failure of conservative treatment, severe sciatica, persistent radicular pain and persistent sensorimotor deficit. Surgical treatment for LDP may be discektomy with or without fusion which can be postrolateral or interbody fusion.[24] The later can be achieved through different approaches as anterior lumbar interbody fusion (ALIF), transforaminal lumbar interbody fusion (TLIF) and posterior lumbar interbody fusion (PLIF). The justification of interbody fusion over posterolateral fusion is that placing bone graft or cage anteriorly with compression will increase the chance of bony fusion.[9]

PLIF is the standard treatment of many lumbar disorders. Some authors[5,67,11,26,33,34] believe that bilateral instrumentation in absence of frank instability is an over treatment and advocate a unilateral fixation. Pedicular fixation abolishes the movement at the operated motion segment, maintains the corrected coronal and sagittal profile and provide optimum environment for fusion. However it is not without hazards of misplacement, loosening and possibility of postoperative pain from muscle dissection and the effect of hard ware on the superjacent facet joints with the possibility of adjacent segment diseases.[14]

In patients with unilateral symptoms correlated to imaging and absence of major instability, unilateral PLIF might prove a wise and logic option. It minimizes the disadvantages of bilateral fixation, achieves a stable construct, and leaves the contralateral muscles undisturbed decreasing postoperative pain and helps rehabilitation.[34]

The aim of this work is to evaluate the results of treatment of degenerative lumbar disc disease with posterior lumbar interbody fusion with unilateral pedicular fixation.

Patients and Methods

This prospective study included thirty patients with lumbar disc diseases treated by posterior lumbar interbody fusion using unilateral pedicular fixation. All surgeries performed through the period from June 2014 to June 2017 in the spine unit at Al Hadra University Hospital, Alexandria, Egypt. Patients followed up for at least one year. Informed consent was taken from all patients.

All patients were subjected to thorough clinical and radiological examination according to the following sheet; personal data, history of medical illness, drug intake and previous operation, full Clinical and neurological examination before surgery.

Pre-operatively every patient was subjected to radiographs: anteroposterior, lateral, oblique and dynamic views. MRI was performed to determine the pathology, level of neural compression, status of the discs, degree of facet osteoarthritis, and foraminal morphology. Computed tomography was ordered in selected cases.

All patients with single or double level lumbar disc lesions with unilateral radiculopathy, grade one degenerative stable single level spondylolisthesis, extraforaminal disc prolapse, and facetal joint cyst were included in this study.

Meanwhile patients with spondylolisthesis > grade one, unstable lytic spondylolisthesis, high degrees of instability (translation more than 3mm and angulation more than 10 degrees in dynamic views),[22] segmental kyphosis, degenerative structural scoliosis, essential lumbar canal stenosis, infection, sever osteoporosis and those who had previous decompression surgery were excluded from this study.

Surgical Technique:

After localization of the level of interest, unilateral subperiosteal muscle dissection was carried out followed by unilateral pedicular instrumentation. Thereafter, decompression and

diskectomy were performed on the symptomatic side. If symptoms are bilateral, foraminotomy of the other side may be added as necessary. Following diskectomy, a local bone graft (from decompression) was inserted to fill the anterior one third of the space. A single polyether ether ketone (PEEK) cage filled with local bone graft was inserted diagonally. Additional posterolateral fusion may be added in some case. Position of screws and cages was checked by fluoroscopy. This procedure can be done for single or double level disc pathology. (Figure 1,2)

Postoperative Assessment:

All patients were assessed pre and postoperative using Oswestry disability score[13] and Visual Analogue Scale for back and leg pain. Postoperative plain radiographs were performed to document position of the construct as well as multi-slice CT-Scan to verify screw purchase. Radiographs were repeated every 3 months. All patients were submitted for multi-slice CT-Scan after one year follow up to assess fusion based on Brantigan, Steffee and Fraser (BSF) criteria;[15]

Results

Age of patients ranged from 22 to 57 years old with a mean age of 40.35±9.82 years. Out of the 30 patients of this study, there were 16 males (53%) and 14 females (47%). All patients had low back pain and sciatica including 18 (60%) left side sciatica and 12 (40%) right side sciatica. Six patients (20%) had sensory deficits and two had partial foot drop. All patients had tenderness in the lower back, and five (16%) had concomitant functional list. Eighteen patients (60%) had their complaints for less than a year, while 10 (33.3%) had their complaints from one to two years and 2 (6.7%) for more than two years with mean duration of symptoms was 13±2 months.

The duration of follow up ranged from 12 to 38 months with a mean of 17.77±7.17 months. Patients follow up was as follow; 4 patients were followed for 12 months, 21 patients (73.3%) were followed for 12-18 months and five (16.7%) were followed for >18 months.

The clinical assessment at the end of follow up showed that 12 patients (40%) had excellent results, resuming unrestricted activity, near complete relief of pain in the back, lower limbs or both. 15 patients (50%) had good results, resuming unrestricted activity, significant improvement in pain with only occasional discomfort in the back or lower limbs, necessitating non-narcotic medication. Three patients (10%) had fair results showing restriction of activities, some improvement but still had intermittent discomfort in the back and lower limbs, needing sometimes non-narcotic medication.

Neurological recovery show that out of 6 patients (20%) with sensory deficits only 3 had mid dyesthesia, and the 2 foot drop recovered gradually to normal power.

The ODI was fair in all patients preoperative, while the post-operative ODI show excellent in 18 cases (60.0%), good in 9 patients (30.0%) and fair in 3 cases. This difference showed statistically significant (P>0.001) improvement in the ODI. The mean preoperative VAS of leg was 6.80±1.37, while the mean post-operative VAS of leg pain was 2.17±0.91. This difference was statistically significant (P=0.001). Preoperative VAS of back pain was 5.33±1.18, while mean post-operative VAS was 2.13±0.90. This difference was statistically significant (P=0.007). (Table 1)

Reported fusion according to BSF criteria in this study was as follow; 15 patients had L4-5 fusion, one patient was fair, 6 were good and 8 were excellent. Twelve patients had L5-S1 Fusion, 2 patients were fair, 7 were good and 3 were excellent. Three patients had L4-L5-S1 fusion, two of them were good and one as excellent. The results showed no statistical significant difference in between. (Table 2)

Patient's satisfaction was evaluated by subjective questioning. 27 patients (90.0%) were satisfied while 3 patients (10%) were unsatisfied. These patients had duration of preoperative symptoms about 2 years, two of them developed pseudoarthrosis.

Correlation study showed that the age and sex of the patients as well as operated level had no significant effect on the net results. (P>0.05), where the duration of symptoms show a significant effect of the net clinical outcome (P<0.05).

When comparing between VAS score for leg pain in patients pre and postoperatively at last follow up according to duration of symptoms it was

found that; the mean change of VAS in patients underwent surgery with <1 year symptoms duration was 128.33±90.25, while those who underwent surgery 1-2 years had a mean of 80.31±40.01 and those who had surgery >2 years had a mean of 35.11±27.15. This difference between the three groups was statistically significant (P>0.001). These results showed a significant improvement in the level of activity of patients who had their surgery in less than a year from the start of their symptoms (Table 4).

Overall, 28 patients (93%) showed successful sound interbody fusion, where two patients had pseudoarthrosis including one showed mild cage retropulsion. Both patients were fairly affected and refused further surgery

Reported complications include; one patient (3.3%) had wound infection that required and responded well to debridement, antibiotic therapy and daily wound care for 2 weeks and another patient (3.3) had intra-operative dural tear which was small inaccessible managed intra-operative by gel foam followed by pressure dressing and bed rest for 5 days and showed clinical improvement with follow up. Two patients had neurological deficit (partial foot drop) grade III due to L5 root affection (one of them had dural tear) and recovered within 6 weeks.

Table 1. Comparison between Pre and Postoperative ODI and VAS

Parameters	Preoperative		Postoperative		Test, P
ODI	No.	%	No.	%	
Excellent	-	-	18	60.0	X^2=38.5, P=0.001*
Good	-	-	9	30.0	
Fair	30	100.0	3	10.0	
Leg pain	6.80±1.37		2.17±0.91		t-test =11.33, P=0.001*
Back pain	5.33±1.18		2.13±0.90		t-test =6.82, P=0.007*

Table 2. Correlation between Level of Fusion and Postoperative ODI at final Follow up

Fusion Level		L4-L5(N=15)		L5-S1(N=12)		L4-S1(N=3)		X^2	P
No,/%		No.	%	No.	%	No.	%		
ODI	Fair	1	6.7	2	16.7	0	0.0	1.58	0.611
	Good	6	40.0	7	58.3	2	66.7		
	Excellent	8	53.3	3	25.0	1	33.3		

Table 3. Correlation between Final Outcome and Demographic Data

Parameters		Excellent		Good		Fair		Test, P
Age		40.0±9.6		39.7±10.36		34.0±11.0		0.455, 0.639
Sex	Male	7	58.3	8	53.3	1	33.3	1.02, 0.236
	Female	5	41.7	7	46.7	2	66.7	
Sciatica	Left	9	75.0	9	60.0	0	0.0	5.62, 0.06
	Right	3	25.0	6	40.0	3	100.0	
Symptoms Duration /years	<1	11	91.7	7	46.7	0	0.0	19.00, 0.001*
	1-2	1	8.3	5	33.3	0	0.0	
	>2	0	0.0	3	20.0	3	100.0	
Comorbidities	No	6	50.0	11	73.3	3	100.0	8.1, 0.424
	Yes	6	50.0	4	26.7	0	0.0	
Level affected	L4-5	7	58.3	6	40.0	1	33.3	1.98, 0.361
	L5-S1	4	33.3	8	53.3	0	0.0	
	L4S1	1	8.3	1	6.7	2	66.7	

Table 4. Correlation between Duration of Symptoms and VAS change

Parameters	Duration of Symptoms			F	P
	<1 (N=18)	1–2 (N=6)	>2 (N=6)		
% of change of leg pain VAS					
Mean±SD	128.33±90.25	80.31±40.01	35.11±27.15	9.12**	0.016*
Median	126.00	80.00	29.0		
% of change of back pain VAS					
Mean±SD	118.2±82.3	75.3±25.2	33.5±22.2	8.25	0.021*
Median	120.0	74.0	31.0		

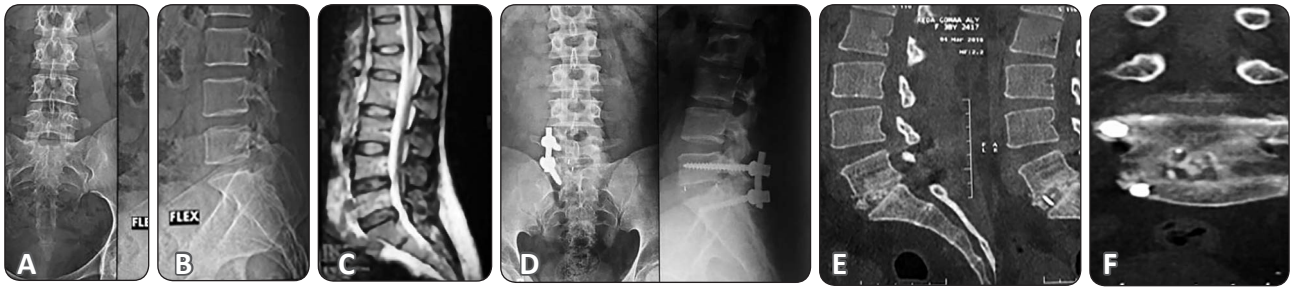

Figure 1. (A) AP plain radiograph (B) dynamic plain radiograph showing stable spine (C) preoperative T2 MRI showing L5/S1 disc disease (D, E) postoperative plain radiographs showing adequate screw purchase and alignment (F,G) multi-slice CT scan showing adequate bone fusion.

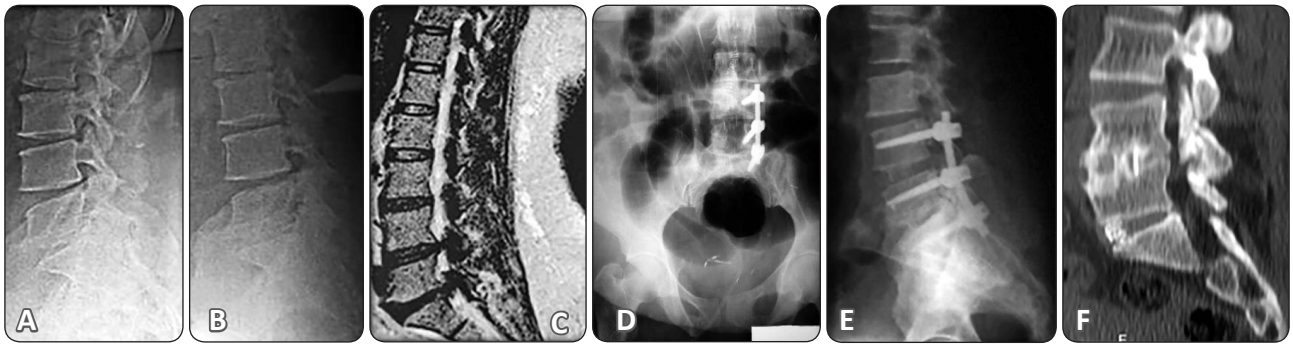

Figure 2. (A,B) A 38-year-old female suffered from lower back pain with radiation to the right leg with dynamic X-rays. (C) MR showed that the intervertebral discs for L4/L5/S1 were degenerated, and the right L5 nerve root was compressed. (D,E) The patient was treated with unilateral PLIF using a single cage supplemented with unilateral pedicle screws via the right side. (F) The radiograph and CT scan at 1-year follow-up showed bony trabeculae bridging the fusion levels.

Discussion

In our study, we assumed solid fusion would provide good clinical outcomes, we assessed our patients clinically and radiologically before the procedure, after the procedure and following the procedure by a period of 24 months to compare the results and determine the success rate of PLIF with regards clinical outcome backed by radiological evidence of fusion.

Numerous previous biomechanical and clinical studies attempted to comparatively evaluate unilateral and bilateral PS fixation approach and inconsistent results were obtained. Chen et al,[6] demonstrated that unilateral PS fixation was good enough to maintain the stability of the spine in a biomechanics study. Patients with recurrent lumbar disc herniation operated by TLIF with unilateral pedicle screw fixation reported less pain & lower disability scores all over the follow up period.[5] Goel et al,[17] reported that the unilateral PS system was

effective to reduce stress shielding of the vertebra and diminish peak stress arising in the adjacent levels above and below the fusion. Toyone et al,[27] recently reported that unilateral PS fixation was associated with a low incidence of adjacent-segment degeneration following posterior lumber interbody fusion. However, an increasing number of published studies have raised concerns over the clinical benefits of unilateral fixation. Yucesoy et al,[33] reported that unilateral PS fixation was inadequate to stabilize a 2-level unilateral lesion when compared with bilateral fixation. Aoki et al,[4] observed that unilateral fixation caused postoperative cage migration more frequently than bilateral fixation in patients who had scoliotic curvature with a Cobb angle >10°. In addition, other biomechanical and clinical study[7] showed that supplementation of a contralateral facet screw might exert a similar effect as bilateral PS fixation on the stiffness or range of motion following TLIF. Therefore supplementation of a contralateral facet screw may possibly compensate the limitations of unilateral PS fixation in lumbar interbody fusion.

Lin et al,[21] suggested that there were no differences between unilateral PS fixation and bilateral PS fixation in VAS and ODI. This finding was in agreement with the results from some previous studies where the patient outcomes were evaluated either using other assessment systems such as the Japanese Orthopedic Association (JOA), 36-Item Short Form Healthy Survey version 2 (SF-36v2) and m Prolo scores respectively or using radiographic parameters such as the whole lumbar lordosis, the segmental lordosis, fusion level disc space angle, lumbar scoliosis angle, and segmental scoliosis angle.

There were significantly less blood loss and significantly shorter operation time in the unilateral PS fixation group as compared with the bilateral PS fixation group. Unilateral PS fixation dissects soft tissue and insert pedicle screws only on one side and therefore it takes less time and decreases blood loss. Moreover, less soft tissue dissection may allow for early recovery. However, the average length of hospital stay was similar in the two groups in this meta-analysis, which was inconsistent with the observation of a previous study where the hospital stay was shorter for unilateral fixation than for bilateral fixation due to early recovery and rehabilitation.[21] One of the reasons for the discrepancy might be the small number of studies included in this meta-analysis. Another reason might be the high heterogeneity among the included studies; in one study the hospital stay was longer in the unilateral group than in the bilateral group because of pulmonary edema in some patients. The current study was carried on 30 patients in Al Hadra university hospital, with mean blood loss 680 cc. with 3 patients needed blood transfusion.

Despite no statistical difference, the overall fusion rate was slightly lower in the unilateral group (91.8%) than in the bilateral group (96%). It was likely that less biomechanical stability in unilateral instrumentation might have negatively impacted the fusion. Because of this, supplementation of a contralateral facet screw has been proposed as a solution to compensate for the insufficient stability of unilateral PS fixation. The incidences of complications in unilateral and bilateral groups were 5.48% (8/146) and 4.61% (7/152), respectively. In this study they had one case of cage retropulsion. This finding was inconsistent with results from many previous studies where insufficient stability of unilateral PS fixation increased the incidence of cage migration.[4] May be due to preservation of contralateral facet joint and lamina with posterior ligamentous complex and cautious preparation of bony end plates.

PLIF not only relieves the pain resulting from nerve compression by neural decompression of the symptomatic side but also restores disc height, maintains vertebral alignment, restores weight bearing and reconstructs stability of the segment. PLIF has been reported to obtain a higher rate of fusion of the intervertebral segments and more satisfactory clinical outcomes than posterolateral bone grafting.[28]

Destruction of the bilateral facet joints and posterior ligament intraoperative can decrease spinal stability and hence increase the risk of perioperative or postoperative complications, such as cage migration.[20] In addition, the nerve root and dural sac always need to be retracted substantially to create two cages, which can cause bilateral nerve root injury or dural tearing. Eventually, additional

bilateral pedicle screw fixation also requires contralateral extensive muscle release, which again increases trauma, blood loss and medical cost.

The biomechanical tests on a calf lumber specimen after PLIF were conducted. The tests showed that the stability of the specimens with unilateral PLIF by inserting a single cage and unilateral pedicle screw fixation was weaker, but there were no significant differences than intact specimens. This finding suggests that this technology can provide adequate initial stability. Many studies have reported that one cage is enough in PLIF or TLIF.[12] Oxland and Lund[23] also advised that single cage PLIF provides high stability in flexion; the supplementary use of pedicle screws improved stabilization in all directions, and two-cage PLIF might increase the risk of damage to the bilateral nerve roots.

In this study, it was assumed that solid fusion would provide good clinical outcome, patients were assessed clinically and radiologically before, after the procedure and following the procedure by a period of about 24 months to compare the results and determine the success rate of PLIF with regards to clinical outcome supported by radiological evidence of fusion.

The overall pre-operative clinical assessment; initially 21 of the patients (70%) showed restriction in their daily activities due to pain and were rated as fair, while 6 of the patients (20%) showed a significant restriction in activity with severe back pain and were rated poor. However, 3 of the patients (10%) had minimal restriction of activity and showed a good clinical assessment but were included in our study as they still had low back pain and sciatica not responding to adequate conservative treatment.

At the end of the follow up period; as regards to Sciatica, 27 patients (90%) have shown immediate postoperative improvement while 3 patients (10%) had not improved by the end of the follow up period. This may be attributed to the long duration of symptoms before the surgery as these patients had their symptoms for more than 2 years, this long duration lead to long standing nerve root compression resulting in nerve root fibrosis. Two of them also developed pseudoarthrosis.

With regards to neurological deficit, patients with sensory deficits have improved completely at the end of the follow up period. Patients with partial foot drop recovered with full power regained at the end of the follow up period. The overall post-operative clinical assessment showed that; 12 patients (40%) had excellent results, 15 patients (50%) had good results and 3 (10%) had fair results showing no statistical significance between the L4-5, L5-S1 and L4-S1 level groups. In a study of 20 patients treated by PLIF using the Harms cage and posterior fixation, Allam[1] stated that the clinical improvement was rated as excellent in 16 cases (80%), good in two patients (10%) and two patients (10%) were fair. The patient who showed non-union had a clinical rating as excellent. In a prospective study by Sears,[25] on 34 cases with lumbar degenerative disorder, using titanium, carbon and PEEK cages he reported 91% satisfactory clinical outcome.

In this study, as regards to level of pain in the lower limb initially; the mean pre-operative level of pain in the lower limb was 6.85±1.03, while the mean post-operative level of pain in the lower limb at the end of the follow up period was 2.1±0.98. This improvement was statistically significant (P>0.001).

As regards to level of pain in the back initially; the mean pre-operative level of pain in the back was 5.33±0.89, while the mean post-operative level of pain in the back at the end of follow up was 2±0.81. This difference was statistically significant (P> 0.01). These results show a significant improvement in the patients' level of pain in the back.

As regards to level of activity; the mean pre-operative level of activity was 3.52±0.98, while the mean post-operative level of activity was 7.3±1.06. This difference was statistically significant (P> 0.001), showing a significant improvement in the level of activity in these patients. Our results were comparable to the study done by Yan et al,[31]

As for the radiological results of our study, we had a fusion rate of 94.4% which is comparable to most studies, Cloward[10] had a 92% fusion rate in all cases of PLIF that he had done. Yan et al showed a fusion rate of 100%.[31] Allam[2] reported that, 19 patients (95%) had shown fusion at the end of follow up.

In a more recent study by Yu et al,[32] they compared fusion rates of PLIF using bone chips only in 34 patients, titanium cages in 31 cases and PEEK

cages in 11 patients. They showed fusion rates of 88.24% in patients with bone grafts only, 93.55% when using titanium cages and 100% with PEEK cages. Galhom et al,[16] studied 106 patient underwent TLIF and found Cage migration incidence was 11.3%, with subsidence (6.7%), and retropulsion (4.6%) of all patients.

In this study we used cage and local bone graft with a fusion rate of 93%. This may point to the good result of local bone to the morbidities of donor site and to the decrease of blood loss.

Ames et al,[3] found no significant difference in flexibility across grafted levels for any motion (flexion–extension, lateral bending, or axial rotation) when comparing an intact specimen with a single-level PLIF. The addition of pedicle screws after single-level interbody graft placement did, however, increase rigidity and subsequently decreased graft dislodgement and/or loosening. This modest improvement of stability for a single-level fusion was found to be drastically enhanced for a two-level fusion with the likely clinical correlation of a lower pseudoarthrosis rate.

Analyzing the biomechanics of instrumented PLIF with one or two cages as to evaluate whether a single cage is adequate for instrumented PLIF, it was found that a single cage inserted in an instrumented PLIF gains approximate biomechanical stability, slight greater subsidence, and a slight increase in screw stress but less early degeneration in adjacent disc and recommended its use in clinical practice.[8]

Conclusion

Our data suggest that conducting PLIF using the diagonal insertion of a single cage with supplemental unilateral transpedicular screw instrumentation enables sufficient decompression and solid interbody fusion.

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Address reprint request to:

Mahmoud AM Nafady, MD.
Orthopedic Surgery and Traumatology department, Faculty of Medicine, University of Alexandria, Alexandria, Egypt. - Email: dr.nafady@yahoo.com
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الملخص العربي

تقييم نتائج التثبيت أحادى الجانب مع سمكرة الفقرات فى علاج الاعتلال الغضروفى القطنى التنكسى

البيانات الخلفيه: ان آلام الظهر المزمنة الناشئة بسبب امراض الغضروف التنكسية تمثل مشكلة شائعة الحدوث في عامة السكان. التنكس غالبا ما ينتج عن التغيرات في الغضاريف الفقرية و المفاصل الخلفية والأربطة المحيطة بالقناة الشوكية. في الممارسة الاكلينيكية، قد يضيق التجويف الجانبي وتضيق قناة العصب مما يؤدى الى الضغط على جذر العصب الذى يمكن أن يتسبب فى أعراض من جانب واحد. علاج الاعتلال القطني التنكسي عن طريق السمكرة الخلفية بين جسمى الفقرات القطنية مع استخدام دعامة واحدة و التثبيت بمسامير احادية الجانب عبر عنق الفقرات مع الحفاظ على الاربطة الخلفية قد يقلل من النزيف و الالم و ايام الحجز بالمستشفى مابعد الجراحة

الغرض: تقييم علاج الاعتلال القطني التنكسي عن طريق السمكرة الخلفية بين جسمى الفقرات القطنية مع استخدام دعامة واحدة و التثبيت بمسامير احادية الجانب عبر عنق الفقرات

تصميم الدراسة: دراسة متابعة اكلينيكية مستقبلية.

المرضى والطرق: أجريت هذه الدراسة على 30 مريض. وكانت مؤشرات الجراحة فشل في الاستجابة للعلاج التحفظى لأكثر من ستة أشهر ، أو وجود عجز عصبي. تم إجراء التقييم السريري باستخدام مقياس الالم و اوزويسترى. تم إجراء تقييم سمكرة الفقرات باستخدام الاشعة المقطعية. وتمت متابعة المرضى لمدة 18 شهرا بعد العمل الجراحي.

النتائج: من الناحية السريرية ، وفقا للوزويستر12(40٪)من المرضى لديهم نتائج ممتازة ، 15 (50٪) لديهم نتائج جيدة ، 3 (10٪) لديهم نتائج عادلة. فيما يتعلق بعرق النسا ، 27 (90٪)تحسن في حين أن 3 (10 ٪) لم تتحسن. من الناحية الإشعاعية ، أظهر 28 مريضا (94 ٪) التئام ناجح في نهاية فترة المتابعة. فيما يتعلق بالمضاعفات ، كان مريض واحد (3.3٪) مصابًا بالتهاب فى الجرح.

الاستنتاج: من السابق نستنتج ان علاج الاعتلال القطني التنكسي عن طريق السمكرة الخلفية بين جسمى الفقرات القطنية مع استخدام دعامة واحدة و التثبيت بمسامير احادية الجانب عبر عنق الفقرات طريقة ناجحةلازالة الضغط على جزور الاعصاب و تمكن من الحام بين اجسام الفقرات.