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# LONG TERM SURGICAL OUTCOME OF TRANSFORAMINAL LUMBAR INTERBODY FUSION (TLIF) IN LYTIC SPONDYLOLISTHESIS

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## ABSTRACT

**Objective:** In this study our main goal is to evaluate surgical outcome of transforaminal lumbar interbody fusion (TLIF) in lytic spondylolisthesis. **Method:** This experimental observational type study was carried out at Bangabandhu Sheikh Mujib Medical University and different private hospital in Dhaka from July, 2008 to June2020. A total number of 105 patients underwent TLIF for lytic spondylolisthesis were taken as a study sample. **Results:** During the study, out of 105 patients (40%) were 30 or below 30 years old, (26.6%) 31-40 years and (20%) 41-50 years. According to lytic spondylolisthesis level where 77% involved L4/L5 and 23% had L5/S1. Lower back pain (LBP) and leg pain VAS score showed relief of pain in all cases where during preoperative period VAS score of LBP and leg pain were 7.7±0.4 and 6.6+3.1 which were decreased into 2.5±0.6 and 2.0 ± 0.5 respectively and preoperative mean ODI score was 79.8± 4.4 which reduced into 11.3± 4.3 after 48 months of surgery. After surgery, 5% patient had superficial infection (Stitch infection), 2% patients had transient paresthesia along the distribution of the exiting root at the level of the surgery, 1% developed neurological deficit in the form of foot drop which gradually improved with Physiotherapy over 3 months and finally no neurological deficit. All patients achieved radiological fusion. 85% patients were rated as TLIF technique as a excellent or good, while 15% patients were rated as fair, no patient was rated as poor. **Conclusion:** Transforaminal lumbar interbody fusion is an easy, powerful and strong technique that achieves precise useful and radiological outcomes in Spondylolisthesis and it is secure and reliable in sufferers. Medical records proved that our sufferers did benefit considerably with this Transforaminal lumbar interbody fusion (TLIF) approach.

**KEYWORD:** transforaminal lumbar interbody fusion (TLIF), spondylolisthesis.

## INTRODUCTION

Spondylolisthesis means forward shift of upper vertebral column over the lower vertebra. In 1854, Killian described the term spondylolisthesis from Greek word "spondylo'' meaning spine and "listhesis'' meaning to slide down a slippery path.[1] The shift is nearly always between 4th lumbar (L4) and 5th lumbar vertebra (L5) or between 5th lumbar (L5) and 1st sacral vertebra (S1).[2] Normal laminae and facets constitute a locking mechanism which prevents each vertebra from moving forward on the one below.[3] Transforaminal lumbar interbody fusion (TLIF) is an increasingly more famous remedy for Spondylolisthesis. This technique turned into introduce by Harms and Jeszenszky in 1982 as a modification of the posterior lumbar interbody fusion (PLIF) method.[4] As there are dangers to damage the

neural elements due to moderate retraction on the thecal sac at Posterior lumbar interbody fusion (PLIF).

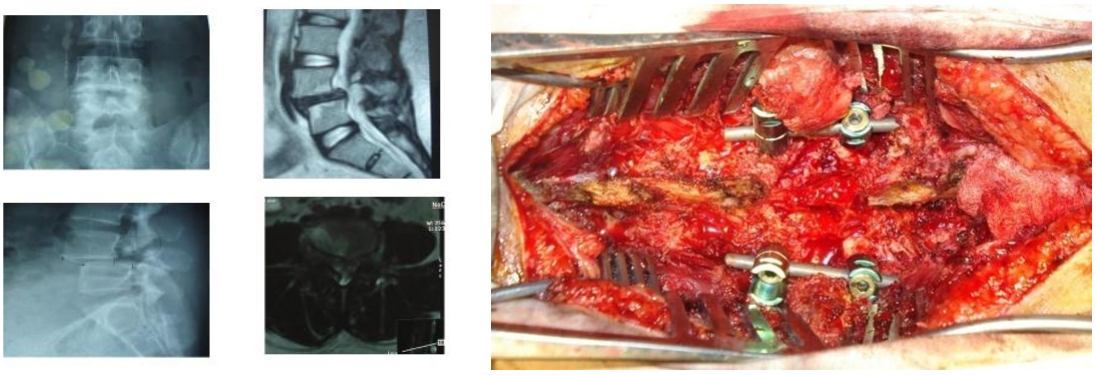

**Figure-1a and 1b: Spondylolisthesis (LYTIC) L4 over L5 and per operative view.**

In this study our main goal is to evaluate surgical outcome of transforaminal lumbar interbody fusion (TLIF) in lytic spondylolisthesis.

**OBJECTIVE**

- To assess surgical outcome of transforaminal lumbar interbody fusion (TLIF) in lytic spondylolisthesis.

**METHODOLOGY**

| | |
|---|---|
| Type of study | Experimental Observational study |
| Place of study | Bangabandhu Sheikh Mujib Medical University and different private hospital in Dhaka |
| Study period | July, 2008 to June 2020 |
| Study population | A total number of 105 patients underwent TLIF for lytic spondylolisthesis were taken as a study sample. |
| Sampling technique | Purposive |

**METHOD**

- During the study, informed verbal consent was taken. Socio-demographic and clinical data were collected from the patients' parents using standard questionnaires and kept confidential during the research.

**Data Analysis**

- Statistical analysis was performed using the Statistical package for social science SPSS version 15.0. A descriptive analysis was performed for clinical features and results were presented as mean ± standard deviation for quantitative variables and numbers (percentages).

**RESULTS**

In figure-2 shows age distribution of the patients, out of 105 patients (40%) were 30 or below 30 years old, (26.6%) 31-40 years and (20%) 41-50 years. The following figure is given below in details.

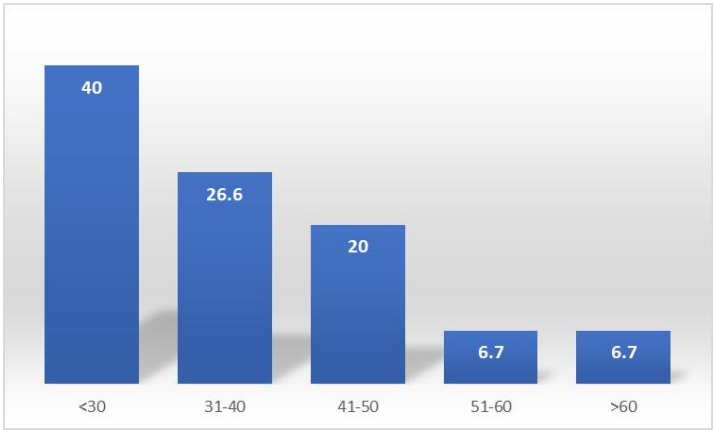


**Figure-2: Age distribution of the patients.**

In figure-3 shows gender distribution of the patients. Majority (60%) of the patients was female. The following figure is given below in details:

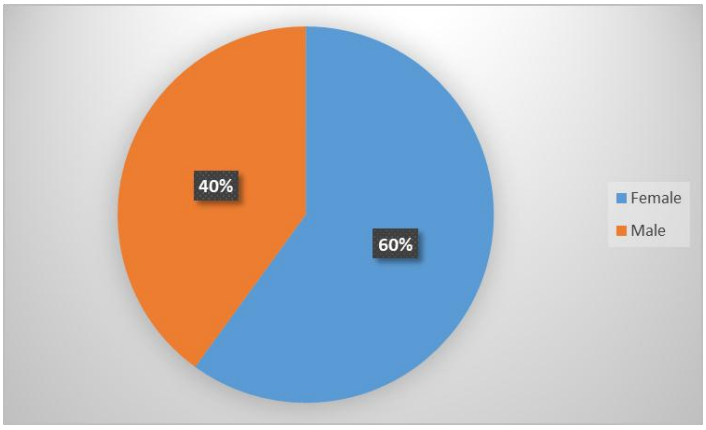


**Figure-3: Gender distribution of the patients.**

In figure-4 shows distribution of the patients according to occupation where housewife was the prime occupation (53.4) followed by farming (26.6%), business (13.3%) and service (6.74%). The following figure is given below in detail:

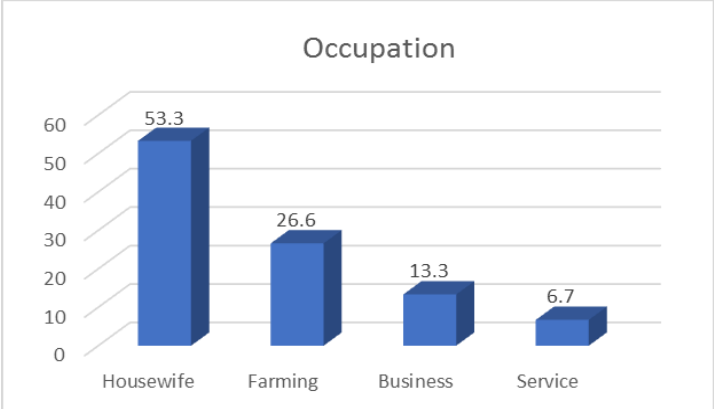


**Figure-4: Distribution of the patients according to occupation.**

In table-1 shows distribution of the patients according to lytic spondylolisthesis level where 77% involved L4/L5 and 23% had L5/S1. The following table is given below in detail:

**Table-1: Distribution of lytic spondylolisthesis level.**

| Lytic spondylolisthesis level | % |
|---|---|
| L4/L5 | 77% |
| L5/S1 | 23% |

In table-2 shows distribution of the patients according to deficits where majority had pain in lower back, 80%. The following table is given below in detail:

**Table-2: Distribution of the patients according to symptoms of lytic spondylolisthesis.**

| Patients according to deficits | % |
|---|---|
| Pain in the low back | 100% |
| Pain in the leg | 60% |
| Increased lordosis | 15% |
| Diminished reflexes | 13% |
| cauda equina impingement. | 2% |

In table-3 shows clinical status of the patients. The following table is given below in detail:

**Table-3: Clinical status of the patients.**

| Mean Body mass index* | 23± 2.4 |
|---|---|
| MAP (mm Hg) | 80.2± 10.5 |
| IMP (mm Hg)* | 63.2± 4.9 |
| Mean blood loss | 300 ml (200–550) |

*** IMP mean intermuscular pressure; MAP mean arterial blood pressure.**

In table-4 shows the lower back pain(LBP) VAS score which showed relief of pain in all cases where during preoperative period VAS score of LBP was 7.7±0.4 which was decreased into 2.5±0.6 after 48 months of surgery. The following table is given below in detail:

**Table-4: The LBP VAS scores showed relief of pain in all cases.**

| F-U time | Mean±SD |
|---|---|
| Preoperative | 7.7 ± 0.4 |
| 12 month after surgery | 4.3 ± 0.6 |
| 24 month after surgery | 3.6 ± 0.3 |
| 48 month after surgery | 2.5 ± 0.6 |

In table-5 shows leg pain of VAS scores. VAS score which showed relief of leg pain in all cases where during preoperative period VAS score was 6.6+3.1which was

decreased into 2.0 ± 0.5after 48 months of surgery. The following table is given below in detail:

**Table-5: Leg pain VAS scores showed relief of pain in all cases.**

| F-U time | Mean±SD |
|---|---|
| Preoperative | 6.6+3.1 |
| 12 month after surgery | 4.2 ± 0.7 |
| 24 month after surgery | 3.5 ± 0.4 |
| 48 month after surgery | 2.0 ± 0.5 |

In table-6 shows the Oswestry Disablity Index (ODI).

**Table-6: ODI scores showed improvement in all cases.**

| F-U time | Mean±SD |
|---|---|
| Preoperative | 79.8± 4.4 |
| 12 month after surgery | 35.4± 7.8 |
| 24 month after surgery | 25.1± 3.6 |
| 48 month after surgery | 11.3± 4.3 |

Table-7 shows complications of the patients after surgery where there were no intra operative complications. 5% patient had superficial infection (Stitch infection) which resolved with antibiotics and regular dressing. 2% patients had transient parasthesia along the distribution of the exiting root at the level of the surgery which resolved spontaneously over 6 weeks. 1% developed neurological deficit in the form of foot drop which gradually improved with Physiotherapy over 3 months. The following table is given below in detail:

**Table-7: Complications of the patients after surgery.**

| Complications | % |
|---|---|
| superficial infection | 5% |
| Transient parasthesia | 2% |
| Neurological deficit in the form of foot drop | 1% |

In table-8 shows radiological fusion grade and result of the patients where respectively in grade-I and grade-II fusions, the mean VAS scores were 1.66 and 2 and the mean ODI were 10.67 and 19.05. 75% achieved grade-I fusion and 25% achieved grade-II fusion. The following table is given below in detail:

**Table-8: Radiological fusion grade and result of the patients.**

| Fusion grade | % | Mean VAS | Mean ODI |
|---|---|---|---|
| Grade I | 75 | 1.66 | 10.67 |
| Grade II | 25 | 2.46 | 19.05 |

In figure-5a and 5b shows 2 years and 5 years follow up of the patients Shows proper alinement of hardware and vertebral column and fusion. The following figure is given below in detail:

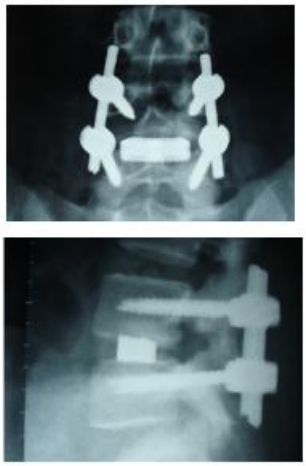

**Figure-5a: Two years follow up.**

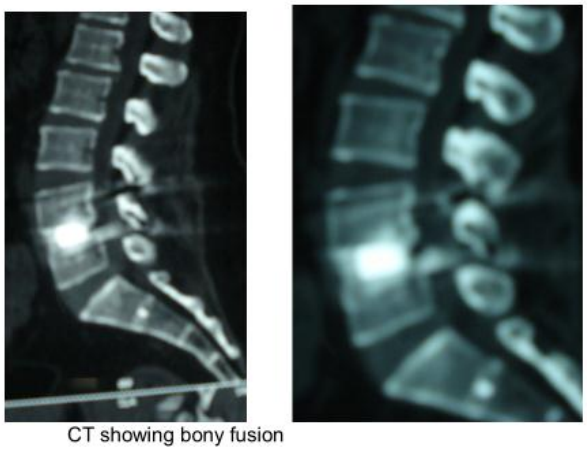


**Figure-5b: 5 years follow up, bone fusion.**

In figure-6 shows satisfaction level of the patients after surgery where overall clinical outcomes were graded by the Parker criteria. 85% patients were rated as excellent or good, while 15% patients were rated as fair, no patient was rated as poor. The following figure is given below in detail:

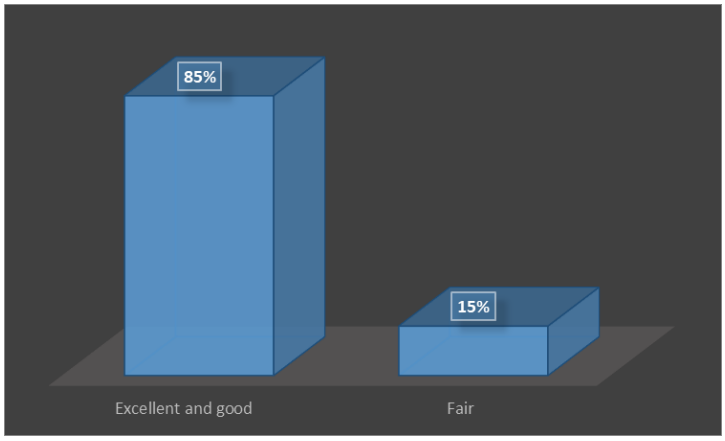


**Figure-6: Satisfaction level of the patients after surgery.**

## DISCUSSION

In one report the indication for the TLIF procedure was lytic listhesis (28patients), and degenerative listhesis (17 patients). The mean blood loss was 290 ml (200–550) and mean operative time 170 min (155–230).[4] Whereas in our study, mean blood loss was 300 ml.

In one study found that mean visual analogue score for back pain was preoperatively 6.8 ±0.721 and postoperatively after 6 months it was 2.6 ± 0.431. Mean visual analogue score for lower limb pain was preoperatively 7.4 ±0.683 and postoperatively after 6 months, it was 2.3 ± 0.569. So improvement from preoperative to post operatively after 6 months for back pain and lower limb pain were 4.2 ± 0.289 ($p<0.0001$) and 5.1 ± 0.114 ($p<0.0001$) accordingly.[5]

Whereas in our study, the lower back pain (LBP) VAS course showed relief of pain in all cases where during preoperative period VAS score of LBP was 7.7±0.4 which was decreased into 2.5±0.6 after 48 months of surgery. The ODI score demonstrated comparable results with the VAS, with patients experiencing consistent pain reduction throughout the 48 months. VAS score which showed relief of leg pain in all cases where during preoperative period VAS score was 6.6+3.1which was decreased into 2.0 ± 0.5after 48 months of surgery.

Another study reported that, complications of the patients after surgery where there were 2% cases of intra operative complications. 8% patient had superficial infection (Stitch infection),5% patients had transient parasthesia.[6]

Where as in our study there were no intra operative complications. 5% patient had superficial infection (Stitch infection) which resolved with antibiotics and regular dressing. 2% patients had transient paresthesia along the distribution of the exiting root at the level of the surgery which resolved spontaneously over 6 weeks which was similar to other study.[9] 1% developed neurological deficit in the form of foot drop which gradually improved with Physiotherapy over 3 months. 85% patients were rated as excellent or good, while 15% patients were rated as fair, no patient was rated as poor in our study which was quite similar to other studies.[7,8]

In our study all patients got radiological fusion. 75% achieved grade-I fusion and 25% achieved grade-II fusion. And mean VAS scores in Grade-I and grade-II fusions the mean VAS scores were 1.66 and 2.46. Also, mean ODI score for Grade -I and Grade II were 10.67 and 19.05. Where as in other study report quite same results as ours. [10]

## CONCLUSION

From our study we can say that, Transforaminal lumbar interbody fusion is an easy, powerful and strong technique that achieves precise useful and radiological outcomes in Spondylolisthesis and it is secure and reliable in sufferers. Medical records proved that our sufferers did benefit considerably with this Transforaminal lumbar interbody fusion (TLIF) approach.

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