Learning Curve of the Surgical Technique of XLIF

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**Objective**

To report the review of the first consecutive cases of XLIF performed by the same surgeon and the discussion of acquisition of the XLIF surgical technique

**Subjects & Methods**

Review of the first 60 cases of XLIF for 16 months from September 2013

(33 males, 27 females, average age 66.9 [range between 22 to 80] years)

The diseases treated consisted of;

- lumbar degenerative spondylolisthesis: 16 cases
- lumbar instability: 15 cases
- lumbar disc herniation/vertebral foraminal stenosis: 11 cases
- degenerative scoliosis: 8 cases
- spinal kyphosis: 6 cases
- trauma: 3 cases
- pyogenic spondylitis: 1 cases

**Study 1:**

Surgery duration & Intra-operative blood loss in;

- Group A - First 20 patients
- Group B - Intermediate 20 Patients
- Group C - Last 20 Patients

**Study 2:**

Comparison of first and last 10 patients for each level in addition to study 1 for;

- L2/3
- L3/4
- L4/5

**NB:** All procedures performed using the left lateral approach with the use of NVM5 spinal monitoring
### Duration of surgery

<table>
<thead>
<tr>
<th></th>
<th>GROUP A</th>
<th>GROUP B</th>
<th>GROUP C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Op Time (min)</td>
<td>299</td>
<td>255</td>
<td>292</td>
</tr>
<tr>
<td>XLIF Op Time (min)</td>
<td>115</td>
<td>80.2</td>
<td>74.7</td>
</tr>
<tr>
<td>XLIF Op Time per Level (min)</td>
<td>74.4</td>
<td>41.1</td>
<td>35.5</td>
</tr>
</tbody>
</table>

The mean total duration of surgery including the postural change and posterior procedure.

### Blood loss during XLIF

<table>
<thead>
<tr>
<th></th>
<th>GROUP A</th>
<th>GROUP B</th>
<th>GROUP C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Blood Loss (ml)</td>
<td>18.6</td>
<td>6.5</td>
<td>7.7</td>
</tr>
<tr>
<td>Blood Loss per Level (ml)</td>
<td>12.0</td>
<td>3.3</td>
<td>3.6</td>
</tr>
</tbody>
</table>
Results 2

**XLIF Op Time per Level (min)**

- L2/3: 48 (first 10) vs. 36 (last 10)
- L3/4: 50 (first 10) vs. 30.5 (last 10)
- L4/5: 78 (first 10) vs. 38 (last 10)

**Blood Loss per Level (ml)**

- L2/3: 4.2 (first 10) vs. 2 (last 10)
- L3/4: 8.9 (first 10) vs. 2.3 (last 10)
- L4/5: 13 (first 10) vs. 4.4 (last 10)

*P<0.05*
Accessing the retroperitoneal cavity presents potential risk of injury to the nerves that travel outside the psoas. Neural structures deep within the psoas musculature are also at risk.
Amit K. S, MD, et al
Lateral Lumbar Interbody Fusion: 
Clinical and Radiographic Outcomes at 1 Year 
A Preliminary Report


43 consecutive patients (lumbar degenerative disc disease)

- Anterior thigh pain 15/43(34.9%)
- Hip flexor weakness 11/43(25.6%)
- Quadriceps weakness 4/43(9.3%)
Comparison between the first consecutive cases by lumbar levels

**Discussion**

- XLIF Op Time per Level (min)
  - L2/3: 48 min
  - L3/4: 50 min
  - L4/5: 78 min
  - Significant difference marked with *: L3/4 vs. L2/3

- Blood Loss per Level (ml)
  - L2/3: 4.2 ml
  - L3/4: 8.9 ml
  - L4/5: 13 ml
  - Significant differences marked with *: L3/4 vs. L2/3, L4/5 vs. L2/3

*P<0.05*
The shorter way to acquire the XLIF technique?

**Discussion**

**Upper Lumbar Levels**
- risk of intraoperative pleural injury
- and/or postoperative pneumothorax

**XLIF should be performed for the L3/4 level at the early stage of introduction**

**Lower Lumbar Levels (Especially, L4/5)**
- risk of neurologic complications
  - Anterior thigh pain
  - Hip flexor weakness
  - Quadriceps weakness
Duration of XLIF varied little after 30 cases
Blood loss during XLIF vary little after 12 cases.
The key is to complete the procedure for the first cases quickly & safely!

In order to minimize variability during the early stages, surgeons must actively engage in practice!
1. We reviewed the first consecutive cases of XLIF performed by the same surgeon and reported discussion on acquisition of the XLIF surgical techniques.

2. The mean duration of XLIF per lumbar level was 74.4 min in group A, 41.1 min in group B, and 35.5 min in group C.

3. The mean blood loss per level was 12 mL in group A, 3.3 mL in group B, and 3.6 mL in group C.

4. In consideration of the learning curve, XLIF should be performed for the L3/4 level for the initial cases.

5. Key to avoiding risks includes a proficiency in conventional anterior fusion techniques, cadaver seminars and surgery observation.

The authors declare no conflict of interest associated with this presentation.