

# Learning Curve for the Open Latarjet Procedure

Aidan Papalia, Andrew Joseph Cecora, Matthew Alben, Paul Romeo, Matthew Kim, Mandeep Virk<sup>1</sup>

<sup>1</sup>NYU Langone Health

**INTRODUCTION:** Although popularity of the Latarjet procedure (LP) continues to rise, arthroscopic instability repair continues to be the most commonly performed procedure for the treatment of recurrent shoulder instability. While learning curves provide useful insight into the rate of improvements in surgeon proficiency, the learning curve for the open Latarjet procedure has yet to be established. The purpose of this study is to determine the learning curve for the open Latarjet procedure and establish a threshold at which proficiency is achieved.

**METHODS:** This was a retrospective study of open Latarjet procedures performed at a single institution from January 2016 to December 2021. All surgeries were performed by single surgeon (senior author). Operative time, as measured by the incision to close time, was the primary outcome of this study. A dataset was created listing open Latarjet cases in chronological order. Cases were classified into groups of 15, and the average operative time for each group was determined. Demographic characteristics and the duration of operative times were compared across groups. A P value less than 0.05 was considered statistically significant.

## RESULTS:

A total of 75 open Latarjet procedures performed by a single surgeon (M.S.V.) meeting inclusion criteria were included in this study. The patients were predominantly male (68 Male [90.7%] versus 7 Female [9.3%]) with an average age of 28.7 +/- 8.5 years **Table 1**. Operative times for open Latarjet significantly decreased after 15 procedures (cases 0-15: 115.9 minutes vs. cases 16-30 98.5 minutes, P=0.0053) **Table 2**. While operative times continued to decrease with increasing cases performed, the learning curve began to plateau after 30 procedures **Figure 1**. After 75 procedures, there was a total decrease in average operative time of 31.5 minutes (P<0.001) **Figure 2**.

**DISCUSSION AND CONCLUSION:** The open Latarjet procedure demonstrates a steep learning curve, demonstrating rapid improvement in operative time after 15 cases. The learning curve begins to plateau after 30 cases, demonstrating the achievement of proficiency in this procedure. Establishing and understanding learning curves provides important tools for monitoring surgeon performance when implementing new procedures into their practice.

Figure 1. Improvement in average operative time for open Latarjet procedure.

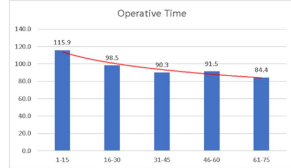


Figure 2. Scatter plot of operative times versus case number.

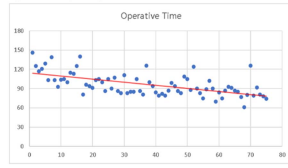


Table 1. Patient demographics

Case Number	Current	0-15	16-30	31-45	46-60	61-75	P Value
Sex, n (%)							
Female	7 (9.3)	1 (8.7)	3 (25.0)	1 (8.7)	1 (8.7)	1 (8.7)	0.841
Male	68 (90.7)	14 (89.3)	12 (80.0)	14 (89.3)	14 (89.3)	14 (89.3)	
Age, mean (SD)	28.7 (8.5)	28.8 (8.7)	33.8 (10.3)	24.1 (8.5)	29.2 (8.2)	27.3 (8.0)	0.891
ROM, mean (SD)	28.1 (8.0)	27.7 (8.2)	28.4 (8.2)	28.8 (7.7)	28.9 (8.3)	29.7 (8.7)	0.941
ROM, n (%)							
1	48 (65.0)	7 (46.7)	11 (73.3)	10 (66.7)	11 (73.3)	10 (66.7)	0.288
2	24 (33.0)	6 (40.0)	4 (26.7)	5 (33.3)	4 (26.7)	5 (33.3)	
3	3 (4.0)	2 (13.3)	0 (0)	0 (0)	0 (0)	0 (0)	
Shoulder, n (%)							
Current	13 (17.6)	2 (13.3)	3 (20.0)	0 (0)	3 (20.0)	3 (20.0)	0.281
Neer	52 (69.5)	13 (86.7)	8 (53.3)	12 (80.0)	9 (60.0)	9 (60.0)	
Farner	9 (12.0)	0 (0)	2 (13.3)	3 (20.0)	3 (20.0)	1 (8.7)	
Unlabeled	1 (1.3)	0 (0)	1 (6.7)	0 (0)	0 (0)	0 (0)	
Laterality, n (%)							
Left	37 (49.5)	6 (38.9)	4 (26.7)	6 (39.9)	11 (73.3)	6 (40.0)	0.103
Right	38 (50.5)	7 (44.7)	11 (73.3)	7 (46.7)	4 (26.7)	9 (60.0)	
Operative Time, mean (SD)	84.1 (17.6)	115.9 (15.1)	98.5 (14.6)	90.3 (12.7)	91.5 (13.6)	84.4 (14.2)	<0.001

\*One-Way ANOVA or Chi-Squared

Table 2. Improvements in average operative times by case group.

Case #	Operative Time	P Value
1-15	115.9	
16-30	98.5	0.0053
31-45	90.3	0.1146
46-60	91.5	0.8061
61-75	84.4	0.1759

\*P-Values calculated as comparison between average operative times between current and previous case grouping