

Comparison of Total Procedure Cost for Lapidus Performed in a Surgery Center using Crossing Screws Versus Plate with Screws Versus Two Staples

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Purpose

The Lapidus procedure is favored for treatment of bunions with a large intermetatarsal angle and hypermobile first ray. Among the various fixations for the Lapidus described in literature, the authors are familiar with three constructs frequently utilized in a surgery center: crossing screws, plate with screws, and two staples. While the implant cost varies significantly, the authors hypothesize that ease of implantation while employing the latter construct allows for a decrease in average tourniquet times and thereby reduces facility cost (\$120 per minute) to affect a competitive total procedure cost.

Scientific Design

A retrospective chart review was performed by the lead author at a single surgery center on 37 patients who met the inclusion criteria. Charts from three different podiatric surgeons were searched beginning in June 2016 through August 2018 for CPT 28297 (Lapidus type bunionectomy involving fusion at the first metatarsal-cuneiform joint), which were then evaluated to determine whether the Lapidus bunionectomy was performed without additional procedures. Additional procedures were deemed a cause for exclusion because the tourniquet time for individual procedures could not be easily deciphered. If the patient met this initial inclusion criteria the tourniquet time was obtained from nursing documentation in addition to post-operative progress notes. As is routine for bunion surgery patients in the authors' offices, few patients in this study were evaluated at 12 months post-operatively. A telephone survey, therefore, was attempted for all patients in the two staple fixation group who underwent surgery prior to August 2017. Decision to include only patients in the two staple fixation group for the telephone survey was made due to the paucity of literature describing this construct as compared to crossing screws and plate with screws which each have well described post-operative outcomes in literature. The questions for the telephone survey were derived from the Patient Subjective Questionnaire for the ACFAS Universal Evaluation Scoring Scale Module I: First Metatarsophalangeal Joint (MPJ) & First Ray [1]. Due to limitations in a telephone survey, the Objective Parameters for this Scoring Scale was deferred.

Statistical Analysis

Mean tourniquet time was determined for each fixation group and standard deviation was included in all cost calculations.



Image 1A-D: Left foot pre-op (A,C) and 6 weeks post-op (B,D) with 2 crossing screws

Image 2A-D: Left foot pre-op (A,C) and 6 weeks post-op (B,D) with plate and screws.

Image 3A-D: Left foot pre-op (A,C) and 6 weeks post-op (B,D) with 2 staples

	2 Crossing Screws (n=7)	Plate with Screws (n=9)	2 Staples (n=21)
Mean Tourniquet Time (min)	68.1 ± 14.75	88.3 ± 30.30	49.5 ± 12.87
Operating Room Fee: \$81.43/min	\$5,548.87 ± \$1,200.90	\$7,192.98 ± \$2,467.54	\$4,032.72 ± \$1,048.08
Anesthesia Fee: \$36.89/min	\$2,513.79 ± \$544.02	\$3,258.61 ± \$1,117.86	\$1,826.93 ± \$474.81
Operating Personnel: \$1.30/min	\$88.59 ± \$19.17	\$114.83 ± \$39.39	\$64.38 ± \$16.73
Total Facility Fee	\$8,151.25 ± \$1,764.05	\$10,566.43 ±	\$5,924.04 ± \$1,539.63
Total Implant Cost	\$708.75	\$1,960.00	\$3,647.00
Total Procedure Cost	\$8,860.00 ± \$1,764.05	\$12,526.43 ± \$3,624.80	\$9,571.04 ± \$1,539.63

Figure 1: Cost comparison for three fixation constructs used by three different podiatric surgeons operating in a single surgery center. Total implant cost includes cost of drill bit and guide wires and is based on confidential contracts with respective companies.

Results

Chart analysis revealed 7 patients who underwent an isolated Lapidus bunionectomy fixated by crossing screws (Image 1A-D), 9 patients fixated by plate with screws (Image 2A-D) and 21 patients fixated by 2 staples (Image 3A-D). The total procedure cost for two screws versus plate with screws versus two staples was \$8,860.00 ± \$1,764.05, \$12,526.43 ± \$3,624.80 and \$9,571.04 ± \$1,539.63, respectively. Of the 21 patients fixated by 2 staples, 18 patients that were beyond one year from date of surgery were contacted for the telephone survey. Of these 18, only 7 completed a telephone survey with an average score of 44/50. Revision surgeries performed on the 21 patients include a revision Akin bunionectomy (1/21) and hardware removal (2/21). There were no non-unions reported in progress notes.

Analysis & Discussion

Tourniquet time and total procedure cost for each implant group fell within one standard deviation of each other. Nonetheless, there appears to be a time saving advantage when using 2 staple fixation for Lapidus bunionectomy which decreased facility cost allowing for relative affordability of the staples. Given fixed reimbursements, the authors conclude that surgery centers may well compare total procedure cost when evaluating whether to accept implants of various costs.

Beyond cost savings, reduced tourniquet times may decrease operative risk to the patient. Decreased duration of anesthesia is better for the patient. There may be lower incidence of wound infection [2], deep vein thrombosis and neuropraxia [3,4].

Although there was poor participation in the telephone survey, there were few revision surgeries identified. Decision not to evaluate pre-operative and post-operative radiographic angles was made because there would be no consistency between the radiology technician obtaining the radiographs and time from date of surgery that radiographs were taken. A subsequent study may be focused on evaluating objective post-operative outcomes for two staple fixation to better validate this optional construct.

References

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