Cost Variation in Temporizing External Fixation of Tibial Plateau and Pilon Fractures: Is There Room to Improve?

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Purpose: Tibial plateau and pilon fractures are common high-energy injuries often treated by temporizing external fixation. The aim of this study was to examine the cost variation of temporizing external fixation constructs used in the staged treatment of tibial plateau and pilon fractures.

Methods: Tibial plateau and pilon fractures treated with temporizing external fixation from 2006 to 2018 were retrospectively identified at a Level-I trauma center by CPT code. Implant costs were determined using the direct purchase price. Fracture classifications were determined radiographically. External fixator construct cost variation was evaluated in relation to the anatomical region (Fig. 1) and operating surgeon (Fig. 2).

Results: External fixator constructs averaged $4518.01 ± $1540.47 ($4348.58, $4687.43), ranging from $1778.56 to $10,012.54. Knee-spanning external fixators were significantly more expensive than pilon external constructs (tibial plateau: $5372.10 vs pilon: $3998.70; $P < 0.01$). However, the 2 groups presented with a similar number of total components (tibial plateau: 14.8 components vs pilon: 12.4 components; $P = 0.13$). Clamps acted as the major contributor for the sum cost in both fixator groups: 71.0% in pilon fixators and 73.6% in tibial plateau fixators (Fig. 1). Tibial plateau and pilon external fixators demonstrated similar variation, 29.0% versus 31.9%, respectively. However, surgeon construct variation ranged from 9.5% to 47.6% overall (Fig. 2).

Conclusion: Our study indicated that there is large cost variation in temporizing external fixation used to treat tibial plateau and pilon fractures. The main driving cost influence was found to be surgeon choice. Currently no data exist to support improved patient outcomes with more expensive constructs. External fixation is a temporary intervention and a value-centric approach is critical.