

AN ANALYSIS OF THE ACTUAL COST OF TIBIAL NONUNIONS

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The financial and medical records of 11 patients diagnosed with a tibial nonunion were evaluated in order to assess the costs associated with the care of this clinical entity. The initial tibia fractures were seen at Hermann Hospital (Houston, Texas) between April 1991 and June 1993. We included only those patients who had a diagnosis of tibial shaft nonunion which we defined as a tibial fracture which was without radiographic or clinical evidence of progressive healing 6 months after the initial injury. A total of 9 patients were available for evaluation and 2 were lost to follow-up.

For each patient the total hospital charges and costs were determined using Hermann Hospital's knowledge-based computer system. In addition, for each total cost of a patient admission or an outpatient visit we were able to divide the total cost into 16 different cost centers (such as routine nursing or radiology). This division enabled us to evaluate where the majority of the monetary resources for tibial shaft nonunions were being consumed. The average total actual cost of treating a nonunion was \$11,333. Approximately 83% percent of that figure is accounted for by central services, nursing care, and the operating and recovery rooms.

In an environment of increased awareness over the cost of medical care more attention is focused on the actual cost of treatment. The use of a knowledge-based computer system, such as Transition System Incorporated, allows administrators and care givers an improved understanding of where the actual costs and charges originate. The objective of this study was to evaluate the costs associated with tibial shaft fracture nonunions.

Other studies have evaluated the social and economic impact associated with various modalities of treatment of lower extremity injuries.¹⁻³ However, to the best of our knowledge, no study has attempted to assess the origin of the fiscal costs accompanying a severe lower extremity injury leading to a tibial nonunion.

MATERIAL AND METHODS

We performed a retrospective review of the financial and medical records of 11 patients who were initially treated at

our institution between October 1991 and September 1994 for a tibial shaft fracture and subsequently presented with a tibial nonunion. We defined a nonunion as a tibial shaft fracture without radiographic or clinical evidence of progressive healing 6 months after the initial injury. In determining the costs used in this study the authors totaled any inpatient or outpatient costs beginning 6 months after the initial injury. This was done in order to minimize the inclusion of money spent on concomitant injuries (78% of patients in this review had a concomitant injury). The authors are aware of the debate as to when fractures could be classified as nonunions.^{4,6} The authors acknowledge that treatment of potential nonunions should be aggressive, often beginning within 6 months of the initial injury.⁷ However, the authors lacked the means by which to differentiate treatment costs specifically for nonunions and costs for other injuries; therefore treatment costs within 6 months after the initial injury were not included. At the most recent follow-up, a total of 9 patients had financial and medical records available for evaluation; 2 patients were lost to follow-up.

Analysis of data in this retrospective study was based upon information obtained through a thorough review of the medical and financial records of the patients. A knowledge-based computer system developed by TSI (Transition Systems, Inc. Boston, Mass.) generated the financial data used in this study. Using financial and clinical information, this cost accounting system may be used to determine the actual cost of procedures or services, to identify areas of cost inefficiency, or to perform long-term case stud-