Research Article

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Consumer Prices for Surgical Management of Ankle Arthritis: Limited Availability and Wide Variability

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Abstract

Background: Healthcare costs for the surgical management of ankle arthritis continue to rise. Patients are generally unaware of the prices of the services they use. Understanding the costs associated with surgical management of ankle arthritis is an important facet of patient care. The purposes of this study were to (1) determine the access to the surgical cost of total ankle arthroplasty (TAAs) and ankle arthrodesis and (2) the variability of the price between the two procedures.

Methods: Fifty foot and ankle centers (25 academic, 25 private) that perform TAAs and ankle arthrodeses were contacted using a standardized patient script. The described patient was a 63-year-old man who had failed conservative treatment of ankle arthritis. Each institution was contacted up to three times in an attempt to obtain a full-bundled surgical quote for a TAA and an ankle arthrodesis.

Results: Twenty-one centers (42%, 14 academic, 7 private) were able to provide a quote for a TAA and an ankle arthrodesis. The mean bundled price for a TAA was $50,332 (SD ± $25,744), with the mean academic and private center quote being $56,529 and $37,937, respectively. The mean bundled price for an ankle arthrodesis was $41,756 (SD ± $26,033), with the mean academic and private center quote being $48,116 and $29,037, respectively. No statistically significant difference was found between the bundled prices for TAA and ankle arthrodesis.

Discussion: This study demonstrated limited availability of consumer prices for TAA and ankle arthrodesis. When comparing different institutions for surgical management of ankle arthritis, there was a wide range of quotes for both TAA and ankle arthrodesis. When comparing the choice of surgical management for ankle arthritis, no statistically significant difference was observed in price between TAA and ankle arthrodesis.

End-stage ankle arthritis is an increasingly common detrimental pathology that can lead to notable physical disability.[1] In the United States alone, there are an estimated 50,000 new cases of ankle arthritis diagnosed every year.[2] With this growing medical and financial burden, the surgical management of the disease is becoming more relevant to both the orthopaedic surgeon and the patient. Currently, the two most common surgical modalities used to treat advanced ankle arthritis are either an ankle arthrodesis or a total ankle arthroplasty (TAA). Although arthrodesis of the tibiotalar joint has historically been the traditional treatment for advanced ankle arthritis, a study using the Medicare population database concluded that the volume of TAAs being performed increased by 1000% between 1991 and 2010.[3]

Given the increasing volume of surgeries for ankle arthritis, the financial burden of managing this pathology will continue to grow. This will likely mirror the overall increasing health expenditures expected at the national level. The Centers for Medicare and Medicaid Services reported that US healthcare spending increased by 4.3% in 2016, to reach $3.3 trillion. This equates to $10,384 per person or 17.9% of gross domestic product.[4] With a projected annual average growth rate of 5.6%, American national health expenditures are expected to reach 19.9% of GDP by 2025.[5]

A potential solution to mitigate rising healthcare costs is for patients to assume greater responsibility in deciding where to seek care and to consider pricing when choosing a provider and treatment.[6-8] As with any purchase, healthcare consumers may be inclined to choose lower cost providers if they believe they are getting a good value in care. In order for this approach to be successful, the costs of such services have to be easily and readily available. Unfortunately, no exhaustive database that may be accessed by either patients or healthcare providers listing prices for orthopaedic services is available. Therefore, a system in which calls are made to healthcare institutions in an attempt to obtain price quotes has been developed and previously published in the literature.[9,10] Using this modality, the aim of this study was to determine the access to the consumer price of surgical treatment for end-stage ankle arthritis, namely TAAs and ankle arthrodesis. The second aim of the study was to determine the variability of the prices among institutions and between the two different procedures. We hypothesized that the costs of the procedures would not be easily accessible, that there would be a wide variability between institutions, and that the mean price of a TAA would be greater than that of an arthrodesis.

Methods

Institution Selection

Fifty orthopaedic foot and ankle centers, 25 academic and 25 private, were selected using the American Orthopaedic Foot and Ankle Society database. Twenty-five different states were chosen to allow for regional variations, with one academic and one private center selected in each state. Medical centers were considered academic if they were affiliated with a medical school and had an orthopaedic surgery residency program. Medical centers were considered private if they were not involved in teaching residents or fellows. The academic and private institutions were selected at random. Providers were only selected if their public website stated that they treat ankle arthritis.

Script Design

A script was designed using a consensus-based approach that included input from all authors. In the script, the patient is a 63-year-old man with a history of right ankle arthritis and who is in need of a TAA or an ankle arthrodesis. His son is calling on his behalf to request the total packaged cost of the surgeries. The patient is self-employed and will be paying for the procedure out of pocket. He is requesting the bundled cost of the surgery before travelling to the institution and scheduling a clinic

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visit with the surgeon. Additional information was provided only if requested. The current procedural terminology cited if requested by the institution were 27702 (ankle replacement) and 27870 (ankle fusion). The International Statistical Classification of Diseases and Related Health Problems-10 code provided if requested was M19.071. The bundled quote was asked to include anesthesia, preoperative care, nursing, meals, medications, one overnight stay in hospital, implants, and the surgeon's fee.

Data Collection

Each institution was contacted up to a maximum of 3 times to provide an out-of-pocket cost. The first telephone number used to contact the centers was the primary number listed on its website to schedule an appointment with the foot and ankle surgeon. If the receptionist who answered the phone was not able to provide the necessary information, they were encouraged to transfer the caller to the hospital financial services or billing department. If the call was transferred, then this was still considered a single attempt at obtaining the pricing information. If the caller was provided a new number to dial, then calling the new number was considered a second attempt. Dropped calls were not considered an attempt. If the institution stated that they wished to e-mail information regarding the bundled quote, then an e-mail address was provided. This address was created solely for this purpose. If a reason for not being provided with the cost information was given, this was recorded.

Statistical Analysis

All statistical analyses were performed using SAS software. An independent *t* test was used to compare prices between academic and private institutions as well as between ankle arthrodesis and TAA. The α level was set at 0.05.

Results

Twenty-one institutions (42%) were able to provide a quote for an ankle arthrodesis and a TAA. Separated by institution type, 56% and 26% of academic and private institutions, respectively, were forthcoming with a price quote. The reason most institutions (75%) were not able to provide the caller with the cost of the surgery was exhaustion of the three call attempts. The other explanation (25%) was the patient must first be seen at their facility and by their surgeons before a price may be offered.

The mean bundled price for an ankle arthrodesis was \$42,808 (SD ± 26,033; range 6,227 to 92,657.09), with the mean academic and private center quote being \$49,693 and \$29,037, respectively. No statistically significant difference was observed in the cost of an arthrodesis between an academic or private facility (P = 0.08). The mean bundled price for a TAA was \$48,944 (SD ± 25,744; range 12,750 to 112,076.17), with the mean academic and private institution cost being \$54,446 and \$37,938, respectively. No statistically significant difference in the price of a TAA between an academic or private facility (P = 0.17) was found. In addition, no difference was observed between the bundled cost of an ankle arthrodesis and a TAA (P = 0.44).

Discussion

The results of this study indicate that obtaining a cost estimate for surgical treatment of end-stage ankle arthritis is difficult. Confirming our hypothesis, only 42% of centers were able to provide a bundled price estimate. As a result, a healthcare consumer would struggle to compare pricing between different centers. These results correlate somewhat with similar studies available in the literature.[9] Willey et al[10] performed a study assessing the availability of consumer prices for bunion surgery and noted 39.7% of the clinics they contacted were able to provide them with a physician fee for the procedure. However, the authors noted that only 8.5% were able to give them a bundled cost. A potential reason for the variability in obtaining a bundled quote may be the persistence of the caller and willingness for the call to be transferred to different departments. The importance of replication studies should not be underestimated as a minimal amount these are performed in the medical literature.

The most common reason for being unable to retrieve a quote was exhausting the 3-call limit. This was usually due to most institutions being unprepared and disorganized with a price request. Frequently, after the first or second call, the caller was referred to the facility's financial counselor or advisor. The call to the financial advisor would usually result in the caller leaving a voicemail or the advisor claiming that they would call back with further information. However, in most instances, the institution never contacted the caller again. This conflicts with price transparency legislation passed in multiple states requiring hospitals and clinics to provide price estimates for nonemergency procedures when requested.[11-13] In the current study, a common reason for not being able to retrieve the cost of the procedures was insistence that the patient must first be seen by the facility's own physicians. Compliance with this would mean that if a patient wishes to do any sort of price comparison, resources and time must first be spent travelling to and being seen by multiple different surgeons. Therefore, insisting that a

patient must be seen in person may in effect increase the burden of healthcare cost.

A wide variation in prices between institutions for both an ankle arthrodesis and a TAA was observed. The range of prices reported for an arthrodesis and TAA were $6,227 to $92,657 and $12,750 to $112,076, respectively. This is consistent with the previous literature citing the consumer prices for a variety of procedures including an electrocardiogram, total hip arthroplasty, and hallux valgus correction.[9,10,14] The variability between facilities may be attributed to the manner in which hospitals and clinics report the consumer price. There are three general terms used in healthcare billing: the charge, cost, and reimbursement. The charge is the amount asked by a healthcare provider for the service; however, this is not necessarily what the provider expects to get paid. The reimbursement is the payment made by a third party (usually an insurance company or federal national insurance program) for the services provided. Cost is the expense incurred by the provider to deliver the healthcare service.[15,16] If the institution cited the charges of the surgical procedure when asked for a consumer price, this could explain the higher prices in our study. However, other facilities provided costs which they stated were specific to patients who are paying out of pocket and it is likely that these prices are more similar to the actual reimbursement accrued by the providers. This information is of interest to surgeons because their practice may be discouraging patients from seeking care if consumer prices are difficult to obtain or exorbitantly high.

A trend was found indicating increased prices for an ankle arthrodesis at an academic versus a private institution (P = 0.08). Higher prices for care at academic institutions has previously been attributed to them receiving higher reimbursement by Medicare to compensate for their educational mission.[17] However, the literature is conflicting regarding the cost of care at academic versus private hospitals, with various studies reporting in favor of one or the other, or concluding no difference between the two.[9,10,18,19]

Although ankle arthrodesis has been used traditionally to treat end-stage ankle arthritis, the clinical outcomes comparing arthrodesis to TAA have been reported in multiple studies.[20-23] With regard to comparing quoted consumer prices for the two procedures, our results showed no notable difference between ankle arthrodesis and TAA. This conclusion differs from our hypothesis and other price comparisons found in the literature. Previous studies have reported on price comparisons between ankle arthrodesis and TAA using different methods. Using the Markov prediction model, Courville et al[24] noted that a TAA costs $20,200 more than an ankle arthrodesis but results in 1.7 additional quality-adjusted life years. Nwachukwu et al[25] concluded that although direct costs were greater with a TAA, once indirect costs were included, TAA was associated with cost savings.

One of the limitations of this study is that the response rate of facilities may differ depending on the forcefulness and perseverance of the caller. Thus, a real patient who wished to find out the cost of their surgery may not cease their inquiry after three calls and may be more insistent with the institution's financial services department. In addition, it is difficult to draw conclusions regarding the true price a patient may be asked to pay for a TAA or arthrodesis with the numbers reported in this study because charges and expected reimbursement are not the same.[26] Also worth noting is the potential impact of price transparency on reducing healthcare expenditure, which is questionable. Although the general population expresses a positive opinion on the concept of shopping for better value health care, other factors may be considered more important. These include loyalty to current providers and perception of quality of care, which may be directly linked to the cost of care.[27] Furthermore, when patients are offered access to price transparency, it may be used by only a very small percentage of the population.[28] Lastly, while previous studies have assessed the availability of consumer prices for surgery, the importance of replication studies should not be underestimated as there are a minimal amount these performed in the medical literature. As Ioannidis[29] identified in a landmark article, only 44% of the most cited original research studies have had their results replicated. A further strength of this article is that it simulates the experience an actual healthcare consumer may encounter when trying to obtain a bundled price for surgery.

Although the current study compared bundled costs between TAA and ankle arthrodesis, additional factors need to be considered that could influence cost as well. Type of insurance plan and associated deductibles could affect the overall costs for a given patient. Based on the patient and associated comorbidities, the ability to perform a surgery at an outpatient center versus a hospital could influence cost differences. Patient factors, including habitus and extent of deformity, could affect not only the type of implant required but also ancillary procedures necessary to appropriately treat the pathology. These variables may lead to costs differences as well. These factors were not specifically evaluated in the present study but certainly need to be considered as the basis of future research.

In conclusion, there is low availability of consumer prices for surgical management of end-stage ankle arthritis. Low availability inhibits a patient's ability to compare prices between institutions to take advantage of the wide variability in costs. A patient may also consider that no difference in price exists between an academic and private institution or between an ankle arthrodesis and a TAA when making a choice regarding their health care.

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