Article

The Influence of Insurance Status on Extensor Tendon Repair Outcomes

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Abstract: Background: Little is known regarding how patient insurance status influences outcomes after extensor tendon-injury repair. We aim to establish a relationship between the outcomes of primarily repaired extensor tendon injuries and patient insurance status. We hypothesize that commercially insured patients will achieve superior outcomes due to more facile access to postoperative hand therapy and fewer barriers to appropriate postoperative care. Methods: A retrospective chart review was conducted of patients who underwent primary extensor tendon repair in any zone, excluding the thumb, at a single large safety-net hospital. Inclusion criteria included a minimum of eight weeks of follow-up, complete data available for review, and an extensor tendon injury requiring primary surgical repair. Four cohorts were examined: patients with commercial insurance, patients with Medicare/Medicaid, patients with county hospital-sponsored insurance, and uninsured patients. Statistical analysis was performed using Chi-Square and ANOVA analyses, with significance defined as $p \leq 0.05$. Results: Of the 62 patients (100 digits) included, 20 had commercial insurance, 12 had Medicare/Medicaid, 13 had hospital-sponsored insurance, and 17 were uninsured. Except for mean age, there were no significant differences between groups in terms of demographic data, medical comorbidities, or digit characteristics. There were also no significant differences in mean follow-up, time to return to full activity, or surgical complications among groups. Procedure duration differed significantly between groups, with procedures lasting longer in uninsured patients. Postoperative final flexion total arc of motion (TAM) and extension measurements were similar across all groups. Additionally, hand therapy visits did not differ significantly between groups. Conclusions: Following extensor tendon repair, patient insurance status did not affect outcomes in terms of final range of motion, return to full activity, or postoperative complications.

Keywords: extensor tendon injury; extensor tendon repair; insurance status

1. Introduction

The extensor mechanism of the hand is made up of a complex interplay of finely balanced musculotendinous connections that depend upon appropriate biomechanical leverage to extend the fingers [1]. As the extensor tendons course from their origins in the forearm, they remain relatively superficial and are therefore vulnerable to injury. While these injuries are relatively common, if not treated appropriately, extensor tendon injuries can be a source of substantial morbidity, including stiffness and/or loss of function and dexterity [2,3]. There are many established prognostic factors predicting outcomes after extensor tendon repair, such as extensor tendon zone of injury [4,5], timing of surgery [6], mechanism of injury [7], timing of postoperative rehabilitation [3,4], rehabilitation protocols [7,8], and certain patient characteristics [7].

Access to upper-extremity surgical care is known to be associated with certain socioeconomic factors, including insurance status. Specifically, commercial insurance had been

associated with better access to care for cubital tunnel syndrome [9], flexor tendon lacerations [10], pediatric trigger thumb [11], and pediatric distal radius buckle fractures [12]. The same impact has not been previously evaluated with regard to extensor tendon lacerations. Further, patients without commercial insurance have been identified as being less likely to complete follow-up after acute hand trauma [13].

Safety-net hospitals serve a vitally important role in their communities as they often provide services not offered at other hospitals, including numerous trauma services such as hand-trauma care. Furthermore, safety-net hospitals frequently have established programs to offer health care access to uninsured, indigent, or under-insured patients (such as hospital-sponsored insurance programs) in addition to patients with commercial or government insurance (Medicare or Medicaid). These programs allow for essential services to be provided to the community without, or with less regard to, the financial status of the patient. While safety-net hospitals may allow for improved access to hand care for patients across a range of insurance status and socioeconomic backgrounds, barriers to follow-up care, including the need for travel to a safety-net hospital, time away from work, and family obligations are still likely to affect patient follow-up, experience, and overall outcomes.

Though the negative impact of limited access to hand care is well documented, there is little literature specifically exploring the effect of insurance status on treatment outcomes, especially in hand surgery. Here, we aim to establish a relationship between the outcomes of primarily repaired extensor tendon injuries and patient insurance status. We hypothesize that commercially insured patients will achieve superior outcomes due to more facile access to postoperative hand therapy and fewer barriers to appropriate planned postoperative care. Achieving a better understanding of how the insurance status of a patient may affect their overall clinical result is important for the hand surgeon so they may better counsel their patients after an extensor tendon injury in addition to taking the necessary precautions to obtain a favorable outcome for more vulnerable patient populations.

2. Materials and Methods

After receiving approval from our regional institutional review board, a retrospective chart review was conducted of all patients who underwent extensor tendon repair between the years 2012–2020 at a single level 1-trauma center safety-net hospital, where they were treated by one of two fellowship-trained hand surgeons, including the senior author. The extensor tendon repair technique used remained consistent throughout the study period, involving a multiple figure-of-8 suture technique for extensor zones 1–4 using 4-0 Ethibond suture (Ethicon; Bridgewater, NJ, USA), and a modified Kessler suture technique with an intra-substance figure-of-8 dorsal cross stitch for extensor zones 5–8 using 2-0 Ethibond suture. Postoperative protocols and rehabilitation programs also remained consistent throughout the study period.

All patients underwent standard postoperative rehabilitation protocols based on their zone of injury. The general postoperative protocol is as follows: the patient is transitioned from a plaster splint placed in the operating room to a cast at their first postoperative visit. At approximately four weeks post-operation, the cast is removed, and an occupational therapist fabricates a custom orthosis to protect the repair as the patient begins active range of motion and composite fist formation exercises. Eight weeks after surgery, the patient begins progressive strengthening exercises. By eight to twelve weeks post-operation, most patients are released to perform activities as tolerated depending on their progress. For a small number of patients, return to full activity was noted over a teleconsultation conducted on a later date after the final documented visit. Final flexion total arc of motion was measured by combining the total active flexion of the metacarpophalangeal (MCP) joint, the proximal interphalangeal (PIP) joint, and the distal interphalangeal (DIP) joint. Final extension was measured by combining the total active extension of the MCP, PIP, and DIP joints. Postoperative measurements were taken using a goniometer; these measurements were supervised by the senior author and performed by a certified hand therapist at every visit. The final recorded measurements were included for each patient.

Procedures involving complete digital extensor injuries in the dorsum of the fingers, hand, wrist, and forearm requiring repair were selected for possible inclusion in the present study. Our primary outcome is objective post-surgical function measured by final flexion total arc of motion (TAM) and maximal active extension. Secondary outcomes include time from surgery to being released to return to full activity and surgical complications such as infection or postoperative tendon rupture.

Inclusion criteria included a minimum of 8 weeks of follow-up, complete data available in the medical record for review, and extensor tendon injury requiring primary surgical repair. Exclusion criteria included less than 8 weeks of follow-up, only incomplete data available for review, repair by tendon transfer or graft, and repairs involving the thumb. Thumb tendon injuries were excluded due to the natural anatomic differences in the motion and function of the thumb in an attempt to decrease the heterogeneity of the sample. Data collected included basic demographic information, history of diabetes, hemoglobin A1c (HbA1c), tobacco use, digit(s) involved, zone of injury, mechanism of injury, repair type (to confirm primary repair), time from injury to repair, surgical complications, number of hand therapy visits, final active flexion (total arc of motion) and extension, time from surgery to being released to full activity, as well as time to final follow-up hand clinic visit.

Patients were divided into four cohorts, each representing one of the four major categories of insurance status encountered at our institution: those with private or commercial insurance, Medicare or Medicaid, hospital-sponsored insurance, and those who were self-pay/uninsured. The hospital-sponsored insurance program is supported by the county and is relatively common at safety-net hospitals. Our institution offers low-cost insurance for indigent county residents who are not eligible for other state or federally funded healthcare programs and are at or below 200% of the federal poverty level. This program offers a variety of plans and programs, including outpatient hand therapy sessions at our institution for zero to five dollars per session [14].

Statistical analysis was performed using JASP version 0.18.2. One-way analysis of variance (ANOVA) was used to determine the relationships between insurance status and sex, age, race, hemoglobin A1c, laterality, digit affected, and zone of injury. One-way ANOVA was also used to test for significant differences in time to surgery, surgical duration, final motion, and length of follow-up. Chi-squared analysis was used to analyze the effect of insurance on infection and postoperative tendon ruptures, as well as to evaluate differences in histories of diabetes or tobacco use. Statistical significance was defined as $p \leq 0.05$.

A post-hoc power analysis was performed utilizing an alpha of 0.05, yielding a power of 0.993 (99.3%).

3. Results

Of the total of 157 digits identified, the final data analysis included 100 digits belonging to 62 patients, with 20 patients (33 digits) possessing commercial insurance, 12 patients (14 digits) possessing Medicare/Medicaid, 13 patients (24 digits) possessing hospital-sponsored insurance, and 17 patients (29 digits) being uninsured. Reasons for exclusion included lack of appropriate follow-up, tendon repairs by graft, and incomplete data available for review in the medical record. The mean ages of these four cohorts were significantly different at 47.7, 47.6, 42.9, and 32.8 years old, respectively ($p = 0.02$), with younger patients more likely to be uninsured.

There were no significant differences identified in sex, race, tobacco usage, presence of diabetes, mean HbA1c, laterality, digit involvement, or zone of injury between the four groups (Table 1).

Table 1. Demographic, medical comorbidities, and digit characteristics based on insurance status.

		Commercial	Medicare/ Medicaid	Hospital-Sponsored	Uninsured	*p* Value
Patients, *n*		20	12	13	17	
Number of digits, *n*		33	14	24	29	
Number of patients with single-digit injury, *n*		13	11	8	11	
Number of patients with multiple injured digits, *n*		7	1	5	6	
Age (mean), *years*		47.7	37.6	42.9	32.8	0.02
Race, *n*						0.76
	Caucasian	15	5	8	4	
	African American	0	3	1	4	
	Hispanic	3	4	4	9	
	Asian	2	0	0	0	
Sex, *n*						0.89
	Male	16	9	10	14	
	Female	5	3	3	3	
Diabetic, *n*		5	4	1	0	0.06
HbA1c (mean), %		8.96	7.73	6.68	n/a	0.38
Tobacco use, *n*		6	3	8	8	0.16
Laterality, *n*						0.30
	Right	7	4	5	9	
	Left	14	8	8	8	
Digit affected, *n*						0.2
	Index	10	7	6	8	
	Middle	13	3	6	11	
	Ring	8	2	7	6	
	Small	2	2	5	4	
Zone of injury, *n*						0.68
1		0	0	0	0	
2		3	0	0	0	
3		3	2	1	7	
4		1	2	2	2	
5		3	4	3	2	
6		8	2	4	14	
7		3	3	2	4	
8		0	1	1	0	

Mean follow-up duration for patients with commercial insurance was 14.0 weeks, 8.9 weeks for patients with Medicare/Medicaid, 8.5 weeks for patients with hospital-sponsored insurance, and 17.2 weeks for uninsured patients, with no statistically significant difference between groups (*p* = 0.19). The mean time from surgery for each group to be released to return to full activity was 15.5 weeks, 8.3 weeks, 10.6 weeks, and 15.0 weeks,

respectively, with no statistically significant difference between groups (*p* = 0.51). Mean procedure duration was significantly different between groups, at 101.0, 92.2, 91.7, and 116.1 min, respectively, with uninsured patient procedures on average longer in duration (*p* ≤ 0.001) (Table 2).

Table 2. Functional results and complications of extensor tendon repair based on insurance status.

	Commercial	Medicare/Medicaid	Hospital-Sponsored	Uninsured	*p* Value
Number of days from injury to surgery, *mean*	17.5	16.5	12.92	6.1	0.61
Procedure duration (minutes)	101.0	92.2	91.7	116.1	<0.001
Number of therapy visits, *n*	2.9	1.1	4.2	4.4	0.28
Final flexion TAM (degrees)	208.5	203.8	192.3	191.5	0.75
Final extension (degrees)	−6.8	−10.4	−7.3	−3.2	0.57
Time to full activity (wk)	15.5	8.3	10.6	15.0	0.51
Time from surgery to final visit (wk)	14.0	8.9	8.5	17.2	0.19
Infection(s), *n*	1	1	0	0	0.53
Rupture(s), *n*	1	1	1	0	0.7

There was no significant difference in range of motion (ROM) between the groups. Mean final active flexion total arc of motion was 208.5, 203.8, 192.3, and 191.5 degrees, respectively (*p* = 0.75). Mean final active extension was −6.8, −10.4, −7.3, and −3.2 degrees, respectively (*p* = 0.57). Mean number of handtherapy sessions was 2.9 in the commercial insurance group, 1.1 in the Medicare/Medicaid group, 4.2 in the hospital-sponsored insurance group, and 4.4 in the uninsured group, with no significant difference noted between groups (*p* = 0.28). There was one postoperative infection in the commercial insurance group, one in the Medicare/Medicaid group, zero in the hospital-sponsored insurance group, and zero in the uninsured group (*p* = 0.53). There was one postoperative rupture in the commercial insurance group, one in the Medicare/Medicaid group, one in the hospital-sponsored insurance group, and zero in the uninsured group (*p* = 0.70) (Table 2).

4. Discussion

According to the results of this study, insurance status did not influence functional outcomes following primary extensor tendon repairs. Patients with all insurance types including commercial, Medicaid/Medicare, hospital-sponsored, and uninsured/self-pay, achieved similar final range of motion with no difference in complication rates. This finding is somewhat surprising considering that a lack of commercial insurance has been shown to impede access to orthopaedic care, including for pediatric fractures [12,15], ankle fractures [16,17], ACL tears [18,19], and knee arthritis [20] in previously reported studies. Hand surgery is no exception to this phenomenon—Calfee et al. [21] found that patients with Medicaid or no insurance faced more barriers to accessing specialty hand care than Medicare and privately insured patients. For example, 100% of local hand surgeons would accept patients with private insurance, but only 62% would accept Medicaid patients. Similarly, Ayoade and Fowler [11] noted that when contacting pediatric orthopaedic practices seeking pediatric trigger thumb treatment, 51.3% of privately insured patients were able to secure appointments compared to only 26.9% for Medicaid patients. Cheng and Rodner [9] found that Medicare/Medicaid patients with cubital tunnel syndrome were more likely to present later and with more severe symptoms than patients with private insurance.

Even in the setting of acute hand trauma, the literature shows that patients without commercial insurance face greater barriers to obtaining care. Draeger et al. [10] found that a fictitious patient with an acute flexor tendon laceration was offered an appointment sig-

nificantly less often if they had Medicaid versus private insurance (67% vs. 82%). Zubovic et al. [13] found that, of patients with acute hand injuries evaluated in the emergency department, uninsured and Medicaid patients had significantly lower follow-up rates compared to privately insured and Medicare patients.

Previous studies have identified that, although the zone of injury of an extensor tendon laceration undergoing primary repair does have an effect on overall outcomes [5], the timing of the surgical repair does not have a significant impact on overall functional recovery [6]. Although our cohort did not identify an increase in time from injury to surgery in uninsured patients compared to those with insurance coverage, it is a logical assumption that uninsured patients may face increased time to surgical care if they are unaware of what community resources are available in their areas, as it has been well established that un- and under-insured patients face greater barriers to accessing hand surgery care than insured patients. While a delay in definitive surgical treatment of extensor tendon injuries has not been found to have an impact on ultimate functional recovery [6], it is less understood whether patient insurance status has an influence or impact on treatment outcomes. In a database study, Sun Cao et al. [22] showed that complication rates after carpal tunnel release were significantly higher for patients with Medicaid compared to those with commercial insurance or Medicare. A retrospective review found that, of all patients undergoing an upper-extremity procedure, Medicaid and uninsured patients reported higher levels of preoperative and early postoperative pain than privately insured and Medicare patients [23]. No such associations have been reported with regard to extensor tendon lacerations.

Although there is limited literature addressing insurance status as a risk factor for worse outcomes in hand surgery specifically, there is support in other areas of the Orthopaedic literature suggesting that patients without commercial insurance are at a higher risk of inferior clinical outcomes. Hung et al. [24] found that pediatric patients with public insurance had significantly higher rates of shoulder re-dislocation following operative treatment for shoulder instability compared to privately insured patients. Additionally, several studies have found that patients without commercial insurance report lower patient-reported outcome scores compared to commercially insured patients following shoulder arthroplasty [25–28]. Finally, Xu et al. [29] found that following total hip arthroplasty Medicaid patients had higher rates of postoperative mortality, morbidity, length of stay, and readmission than privately insured patients.

Of note, the present study took place at the county's safety-net hospital. It is possible that this fact may have contributed to the findings of this study. Safety-net hospitals make primary and specialty care more economical and accessible to uninsured and under-insured patients [30–32]. Additionally, the hospital-sponsored insurance program offers affordable healthcare to indigent county residents who are not eligible for other state- or federally funded healthcare programs, and are at or just above the federal poverty income level [14]. Patients eligible for these programs are often enrolled prior to their traumatic event and present directly to the safety-net hospital after their trauma, resulting in decreased lag time between the trauma and definitive surgical treatment. The literature suggests that these programs can decrease emergency room visits and improve perceived health status, as well as improve access to primary and specialty care and to prescription medications [33,34]. Given the above factors, it is possible that all groups achieved similar results because the patients were being treated at a safety-net hospital, which has been shown to increase access to care for marginalized populations. Furthermore, our safety-net hospital is well known as the facility that patients come to if they are uninsured. As such, uninsured patients tend to present to our ED initially while other insured patients are frequently referred to our clinic from outside EDs, which adds some time lag. Also, uninsured and hospital-insured patients do not require pre-authorization from insurance companies prior to surgery, which allows for quicker scheduling at times.

Another explanation for our findings is that the hospital-sponsored insurance program offers accessible hand therapy for free or for five dollars, depending on the patient's

plan [14]. It is well established that postoperative hand therapy timing and protocols affect the outcomes of extensor tendon repairs [3,4,7,8]. Although the mean number of postoperative hand therapy visits for the four groups were not significantly different, patients with hospital-sponsored insurance and uninsured patients averaged greater than four visits postoperatively compared to less than three visits for the commercially insured and Medicare/Medicaid groups. These results are unexpected and are counter to the previous literature that shows that patients with commercial insurance are more likely to attend hand therapy [13]. One possible explanation for the variation in number of therapy visits is the number of involved digits. Medicare/Medicaid patients attended the least number of therapy sessions, but they were also much more likely to have a single-digit injury compared to the remaining groups. Patients with multiple injured digits would logically have therapy needs exceeding that of patients with a single affected digit. Although it is difficult to quantify the clinical difference that 1–2 additional therapy sessions might have had on the final digital range of motion, it should be considered as a possible explanation of why these groups achieved similar results to the commercially insured patients. In a setting where un- or under-insured patients face difficulty obtaining access to hand therapy services, these patients might benefit from more frequent clinic appointments with the treating surgeon to counsel them regarding a home rehabilitation program in the office if they are unable to obtain formal occupational therapy. It should also be noted that, when considering the injured digit individually rather than individual patients, patients with hospital-sponsored insurance averaged greater than 13 therapy visits compared to three or less for the other groups, demonstrating the overall effectiveness of the hospital-sponsored insurance at our safety-net institution. Despite our findings that postoperative therapy visits range from 1.1 visit to 4.4 visits without a notable outcome variation, we still encourage diligent compliance with our standard extensor tendon rehabilitation protocol and we encourage therapy to prevent and address joint stiffness, scar complications, and tendon gliding issues.

An additional finding of this study was that the operative duration for the uninsured patients was significantly longer than the other groups, averaging 15 min longer than the commercial group and approximately 24 min longer than the Medicare/Medicaid and hospital-sponsored groups. A likely cause of this increased procedure duration was the fact that the uninsured group suffered more multi-digit injuries compared to the other groups. The uninsured group 17 patients with a total of 29 digit injuries. As expected, surgeries including multiple tendon repairs and potentially more severe soft tissue injury management will lead to increased operative times.

The present study has several limitations that must be acknowledged. First, although retrospective studies certainly have their value in many contexts, several inherent limitations exist due to study design, including the possibility of inconsistent data, missing information, recall bias, and unidentified confounding variables. Also, uninsured and under-insured patients have been noted previously to be less likely to complete postoperative follow-up [13]; however, uninsured patients in our cohort surprisingly had the longest average postoperative follow-up of any insurance sub-group at 17.2 weeks (compared to 14.0 weeks commercial, 8.9 Medicare/Medicaid, and 8.5 hospital-sponsored). Additionally, 57 of the initial 157 digits that underwent surgical repair for extensor tendon injury were not included in final analysis, raising concern for a possible selection bias. Of the 57 patients excluded due to lack of appropriate follow-up, 16 had commercial insurance, 11 were hospital-sponsored, 12 had Medicare/Medicaid, and 18 were self-pay. Although objective outcomes (motion) were collected, patient-reported outcome measures or functional scores were not obtained. The addition of patient-reported outcome measures would certainly provide a more holistic view of the impact of insurance status on outcomes after an extensor tendon repair. Finally, certain associated injuries such as fractures were not included for consideration due to the retrospective nature of this study and to limit the purview of the study to isolated extensor tendon injuries only. It is important to recognize that the current results are not likely to be representative of injuries requiring treatment of a fracture in

addition to an extensor tendon injury, which is a common concomitant injury, especially in zones 1–4.

An additional weakness of the study is the relatively small sample sizes represented within each group. It is possible that different results might have been found if more patients were captured in each group. As discussed above, when the results are considered from the digit level rather than the patient level, thereby increasing the sample size in each group, different trends in the results are seen. However, we chose to examine the data on the patient level as patients have insurance, while individual digits do not.

Another potential variable to consider is the setting of this study. Given that this study was conducted at a safety-net hospital, we may not have captured a fully accurate and generalizable representation of the population. It is possible that all of the patients, including those with commercial insurance, faced similar socioeconomic challenges and, therefore, do not represent the expected socioeconomic status of typical patients with commercial insurance.

Strengths of the present study include the use of uniform operative techniques, post-operative protocols, and therapy treatment algorithms throughout the study period. Additionally, uniform methods of measuring range of motion were utilized with a goniometer, and these measurements were supervised by the senior author and performed by a certified hand therapist to minimize inter-observer bias and variability.

Patients from lower socioeconomic backgrounds have a known higher incidence of upper-extremity injuries and fractures [35,36]. Traumatic hand injuries can have devastating outcomes for patients, especially for those who depend on their hands for work such as manual laborers. The proper treatment of such injuries can represent tremendous financial and logistical burdens for many patients. Prior reports have identified approximately 40% of adults as being unable to independently cover USD 400 of unexpected medical expenses [37], and medical costs are the number one reason why Americans file for bankruptcy [38]. For these reasons, safety-net hospital systems and affordable healthcare options are vital to the availability of accessible healthcare, especially for vulnerable populations [39,40].

Safety-net hospitals are a vital and crucial part of the healthcare system overall, especially for underserved populations. They provide care for a significant portion of uninsured, Medicaid, and other vulnerable patient populations in their communities. These hospitals often serve communities and populations that other hospitals do not, making them a valuable resource for underserved individuals. They typically offer critical life-saving services that are not available at other hospitals, including trauma, burn care, neonatal intensive care, and inpatient behavioral health services. Despite facing financial and organizational pressures, many safety-net hospitals have adopted transformational performance-improvement approaches designed to improve patient outcomes and financial performance, such as hospital-sponsored insurance programs. Despite the financial challenges these institutions face due to the costly services they provide and the insurance status of the patients they serve, safety-net hospitals continue to provide essential services to their communities. They are a vital part of the healthcare system, providing care to those who might otherwise go without, and contributing to the overall health and wellbeing of the communities they serve.

Unexpectedly, we found that patients with commercial insurance achieved similar final range of motion after extensor tendon repair to the uninsured patients, patients with Medicare/Medicaid, and patients with hospital-sponsored insurance. These results suggest that hospital-sponsored insurance programs may provide equivalent health outcomes to commercial insurance plans for the treatment of extensor tendon injuries. Additionally, the results of this study speak to the potential effectiveness of safety-net hospitals in providing high-quality care to marginalized populations, at least in regard to the care of extensor tendon injuries.

There is a paucity of literature regarding the influence of insurance status on hand surgery outcomes. Furthermore, the authors identified no studies that examine the objective

outcomes of patients with county-sponsored health insurance undergoing hand surgery, as was a focus of this study. To our knowledge, this study is the first to demonstrate a relationship between patient insurance status and extensor tendon-repair outcomes. Ultimately, more studies, including larger patient populations, are needed to validate these findings, but the above results demonstrate the potential effectiveness of these county health programs as well as safety-net hospitals in the overall hand care provided regardless of patient insurance status. In institutions without a hospital-sponsored insurance plan, access to postoperative therapy for these patients would be notably more costly and less likely to be completed. As such, an argument can be made that early referral to a safety-net institution for extensor tendon lacerations in uninsured or under-insured patients may allow for access to an appropriate level of hand-surgical management with no significant detrimental effect on overall patient functional outcomes when utilizing the safety-net resources available for postoperative management.

5. Conclusions

Following extensor tendon repair, patient insurance status did not affect outcomes in terms of final range of motion, return to full activity, or postoperative complications at a single large safety-net hospital.

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