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Original Research

When Numbness and Tingling Play a Role—Sexual Function in Compressive Neuropathy

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Purpose: Compressive neuropathies such as carpal tunnel and cubital tunnel syndrome can lead to sensation loss, muscle weakness, joint contractures, and disrupted sleep. The interplay between these conditions and the effect on patients' intimacy is unknown. The purpose of this study was to examine sexual function before and after surgery in patients undergoing carpal tunnel release or cubital tunnel release.

Methods: All patients 18 years or older who underwent unilateral or bilateral carpal tunnel release and/or cubital tunnel release, performed either open or endoscopically, between January 2021 and August 2022, were retrospectively identified. An anonymous 21-question survey assessing pre- and postoperative sexual function was sent electronically to patients who were between 3 months and 2 years postprocedure.

Results: A total of 47% of respondents reported that their upper extremity symptoms disrupted their sexual activity. Before surgery, various challenges were reported: paresthesia (84%), pain (61%), reduced strength (53%), and reduced motion (40%). A total of 65% of patients changed positions before surgery, most frequently by avoiding weight-bearing (79%) and using the affected arm (55%). After surgery, 61% reported an easier time engaging in sexual activity, which was most frequently attributed to diminished paresthesia (69%) and pain (67%). A total of 73% of patients resumed sexual activities within 3 weeks of surgery. Ultimately, 32% of patients were more satisfied with their sexual function after surgery.

Conclusions: Sexual function is intimately tied to the physical and mental health of individuals. Surgical release improves sexual function and satisfaction.

Type of study/level of evidence: Retrospective Case–Control Cohort, Therapeutic III.

Sexual dysfunction is a notable yet often overlooked health issue that occurs in 43% of women and 31% of men.[1] Previous studies demonstrate that it is associated with lower quality of life, health status, satisfaction, and sense of belonging.[2,3] Poor sexual health even imposes a substantial economic impact with higher rates of absenteeism and poor work productivity.[4,5]

Historically, sexual function has been overlooked in comparison to other patient-reported outcome measures within orthopedics and across the subspecialities. However, recent studies highlight the importance of orthopedic intervention in improving sexual function. These studies are mostly in adult reconstruction, specifically total knee and total hip arthroplasties and rotator cuff repairs.[6–8] Aside from the shoulder, the exploration of sexual function and orthopedic intervention is limited within the upper extremity.

Even in frequently encountered conditions such as carpal tunnel and cubital tunnel syndromes, it is unknown how these compressive neuropathies and their associated interventions affect sexual function. This complicates our ability to provide recommendations and guidance as clinicians. So far, only data available from other fields are used to counsel patients on sexual function following carpal tunnel release (CTR) and cubital tunnel release (CuTR).

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Given the impact of sexual function on quality of life, it is important to acknowledge pre- and post-operative sexual activity in patients undergoing either CTR or CuTR. Our null hypothesis is that there is no difference in sexual satisfaction before and after CTR or CuTR. Our secondary hypotheses are that there is no difference in sexual frequency before and after CTR and CuTR. Finally, the study aimed to assess symptoms and positions interfering with sexual activity in the perioperative setting of CTR and CuTR.

Methods

Institutional review board approval and informed consent were obtained for all patients participating in the study. Patients undergoing CTR or CuTR release between January 2021 and August 2022 by 16 fellowship-trained orthopedic hand surgeons were retrospectively identified using the current procedural terminology codes 29848 (endoscopy, wrist, surgical, with the release of transverse carpal ligament), 64721 (neuroplasty and/or transposition; median nerve at carpal tunnel), and 64718 (neuroplasty and/or transposition; ulnar nerve at elbow). Patients who were at least 18 years of age who underwent unilateral or bilateral CTR or CuTR, performed either open or endoscopically who were at least 3 months, and at most 2 years postprocedure were included in the study. Patients who were pregnant or patients with CTR or CuTR performed concomitantly with other procedures were excluded from the study.

All patients meeting inclusion criteria were electronically sent an anonymous 21-question survey (Supplement 1), modified from Nugent et al[8] and Kazarian et al,[6] assessing both pre- and post-operative sexual function tailored toward CTR and CuTR. As performed in Nugent et al,[8] all survey responses were multiple choice questions to accommodate standardization of the data and statistical analysis. Surveys were sent via the Research Electronic Data Capture, a secure Health Insurance Portability and Accountability Act-compliant web application designed to manage online surveys.[9,10] Surveys were sent weekly, reaching a maximum of 3 times. Surveys in which the respondents did not provide consent or were abstinent from sexual activity before and after surgery were excluded.

The survey was distributed to 1,807 patients meeting inclusion criteria. Of those, 165 did not have valid email addresses on file, resulting in 1,642 sent emails. A total of 97 patients completed the survey, resulting in a survey response rate of 5.9%. A total of 16 surveys were excluded for either not providing consent (six) or remaining abstinent in sexual activity both before and after surgery (10). The remaining 81 surveys were included in the study analysis.

An a priori power analysis determined that 75 surveys were required to reach a desired power of 80.0% with an alpha of 0.05. Responses were calculated based on the number of respondents per question. Statistical analyses were performed using Chi-Square and Fisher Exact tests when appropriate. Statistical significance was defined as P values $< .05$.

Results

Preoperative sexual function

Within 3 months prior to surgery, 94% of participants engaged in sexual activity (Table 1). Of those, 47% reported that their upper extremity symptoms interfered with their sexual activity, occurring most frequently between 6 months and 1 year prior to surgery. In 32%, upper extremity symptoms interfered for a duration exceeding 1 year. Of the 5 patients who refrained from sexual activity within 3 months prior to their surgery, 40% reported that the quality or frequency of their sexual activity was affected by their upper extremity symptoms.

Table 1
Preoperative Engagement in Sexual Activity

Sexual Activity Engagement Prior to Surgery	Number of Respondents
Engaged in sexual activity within 3 mo prior to CTR or CuTR (%)	76 (93.8)
N = 81 respondents	
UE symptoms interfered with quality or frequency of sexual activity prior to surgery (%)	38 (46.9)
N = 81 respondents	
Duration that UE symptoms affected sexual activities prior to surgery (%)	
N = 37 respondents	
1–3 mo	1 (2.7)
3–6 mo	8 (21.6)
6 mo–1 y	16 (43.3)
>1 y	12 (32.4)

Upper extremity symptoms affecting sexual activity

Patients most commonly cited preoperative paresthesia (84%), pain (61%), reduced strength (53%), and limited ROM (40%) as factors that disrupted their sexual activity (Fig. 1). After surgery, a substantial proportion of patients noted improvement in these symptoms, resulting in easier engagement in sexual activity. Reductions in paresthesia (69%) and pain (67%) were associated with the greatest improvement in sexual activity. However, these symptoms, in addition to reasons unrelated to the upper extremity and concern for damaging their surgical site, were also cited as contributing factors to either having less sex or remaining abstinent. A total of 4% of patients reported either having pain or injuring their surgical site during sexual activity.

Sexual positions

Before surgery, 65% of patients changed positions during sexual activity due to their upper extremity symptoms. They most frequently avoided weight-bearing (79%), using their affected extremity (55%), and being on top of their partner (43%) (Fig. 2). An additional 34% of patients avoided either lying on their side or being below their partner. Alternatively, lying below (74%) or on top of their partner (53%) and lying on their side (49%) were reported as comfortable positions. Following surgery, only 40% of patients adjusted their sexual position, frequently to avoid weight-bearing (63%) and using their affected extremities (47%). Lying below (34%) or on top (25%) of their partner or on their side (22%) was less challenging.

Frequency of sexual activity following surgery

All patients engaged in sexual activity after surgery. A total of 73% of patients resumed sexual activity within 3 weeks or less following surgery, with 30% engaging in sexual activity within 1 week (Fig. 3). Only 11% of patients refrained from sexual activity for more than 6 weeks.

Sexual satisfaction following surgery

Sexual behavior was also analyzed based on sexual satisfaction (Table 2). A total of 32% of patients were more satisfied with their sexual function after surgery, whereas 68% reported either no change (62%) or no improvement (6%). Among those more satisfied,

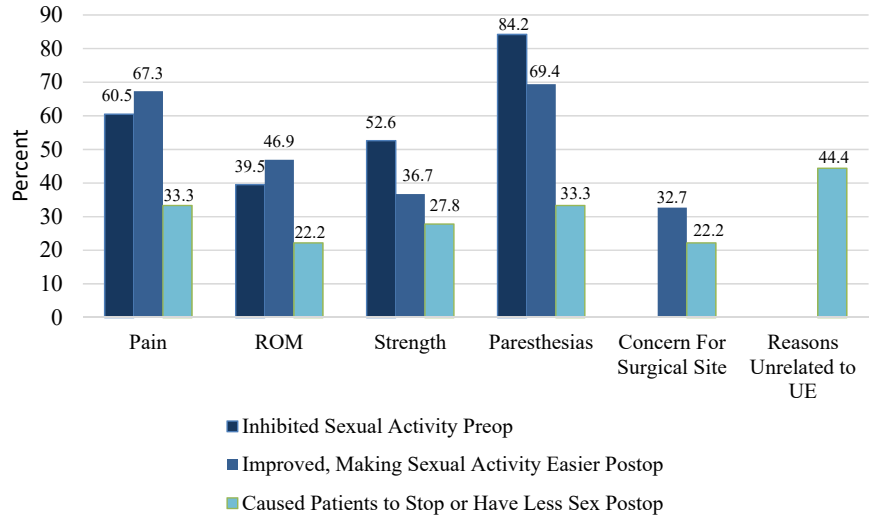

Figure 1. Comparison of upper extremity symptoms that affected sexual function before and after surgery.

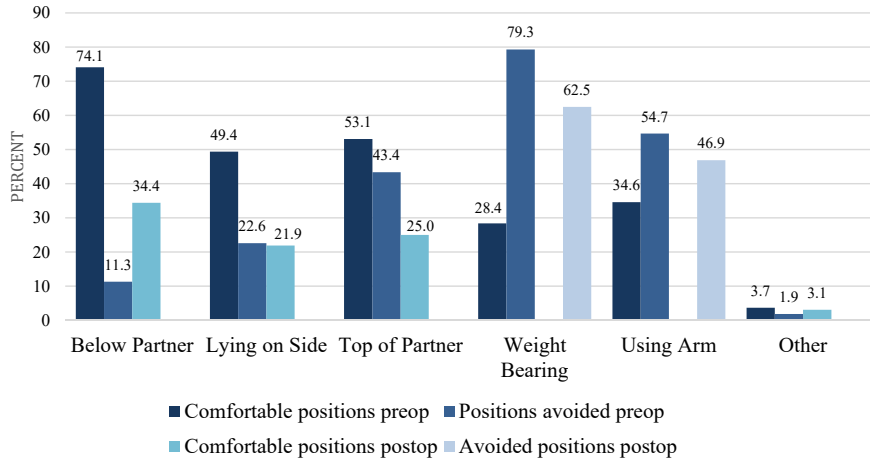

Figure 2. Comparison of positions that affected sexual function before and after surgery.

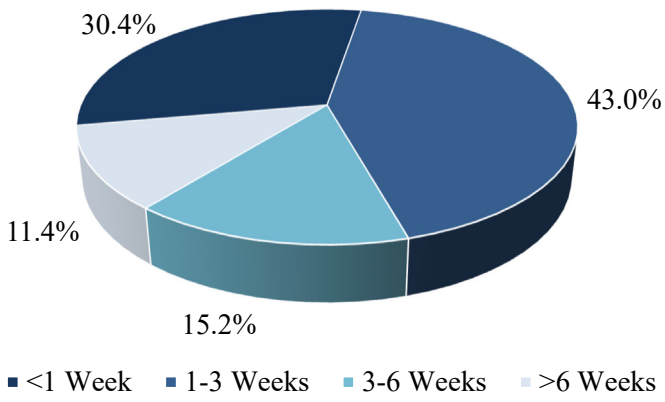

Figure 3. Duration of abstinence from sexual activity following carpal tunnel or cubital tunnel release.

73% reported that their symptoms interfered with their sexual function before surgery, which was greater than those who were either less satisfied (60%) or reported no change in satisfaction (32%) ($P = .001$). However, patients who were more satisfied reported higher rates of engaging in more sexual activity compared with those who were less satisfied or reported no change in satisfaction (Table 3). Most patients engaged in the same amount of sexual activity after surgery, which was significantly greater among those who reported no change in sexual satisfaction ($P < .001$).

Discussion

Sexuality is deeply entwined in the quality of life and health of most individuals.[11] However, to date, sexual function in patients with median and ulnar compressive neuropathies is not well-understood. We demonstrated that neuropathic symptoms associated with these conditions can disrupt sexual function. Surgical release can improve symptoms and facilitate easier sexual engagement.

Neuropathic symptoms interfered with the quality and/or frequency of sexual activity in 47% of respondents in our study. This is in range with studies assessing knee and hip osteoarthritis, which demonstrate that 45% to 77% of patients endorse some form of sexual limitation preoperatively.[6,12–15] However, it is less than that reported in patients with rotator cuff tears. Nugent et al[8] found that 65% of respondents experienced sexual limitations prior to rotator

Table 2
Comparison of Preoperative and Postoperative Sexual Activity Based on Satisfaction

Prior to or After CTR or CuTR	Less Satisfied (N = 5) (%)	More Satisfied (N = 26) (%)	No Change in Satisfaction (N = 50) (%)	*P* Value
Prior to CTR or CuTR				
Engaged in sexual activity within 3 mo prior to surgery	5 (100.0)	24 (92.3)	47 (94.0)	1.000
Symptoms interfered with sexual activity	3 (60.0)	19 (73.1)	16 (32.0)	.001*
Adjusted sexual positions	5 (100)	21 (80.8)	27 (54.0)	.015*
After CTR or CuTR				
Frequency of sexual activity				< .001*
No change	1 (20.0)	10 (38.5)	40 (80.0)	
Less sex	4 (80.0)	6 (23.1)	8 (16.0)	
More sex	0 (0.0)	10 (38.5)	2 (4.0)	
Duration of abstinence from sexual activity				.185
<1 wk	1 (20.0)	6 (24.0)	17 (34.7)	
1–3 wk	2 (40.0)	9 (36.0)	23 (46.9)	
3–6 wk	1 (20.0)	4 (16.0)	7 (14.3)	
≥6 wk	1 (20.0)	6 (24.0)	2 (4.08)	
Adjusted sexual positions	3 (60.0)	13 (50.0)	16 (32.0)	.236
Injury or pain from sexual activity	0 (0.0)	2 (7.7)	1 (2.0)	.286

* *P* value < .05.

Table 3
Frequency of Sexual Activity Following Carpal Tunnel and Cubital Tunnel Release Based on Satisfaction of Sexual Activity

Frequency of Sexual Activity Based on Satisfaction of Sexual Activity	Less Satisfied (N = 5) (%)	More Satisfied (N = 26) (%)	No Change in Satisfaction (N = 50) (%)	*P* Value
Frequency of sexual activity within first 6 wk				< .001*
Less	4 (80.0)	2 (8.0)	6 (12.0)	
Same	1 (20.0)	14 (56.0)	43 (86.0)	
More	0 (0.0)	4 (16.0)	0 (0.0)	
Did not engage	0 (0.0)	5 (20.0)	1 (2.0)	
Frequency of sexual activity from 6 weeks to 3 mo				< .001*
Less	4 (80.0)	0 (0.0)	1 (2.0)	
Same	1 (20.0)	18 (72.0)	48 (96.0)	
More	0 (0.0)	6 (24.0)	1 (2.0)	
Did not engage	0 (0.0)	1 (4.0)	0 (0.0)	
Frequency of sexual activity from 3 to 6 mo				< .001*
Less	4 (80.0)	0 (0.0)	1 (2.0)	
Same	1 (20.0)	19 (73.1)	47 (94.0)	
More	0 (0.0)	7 (26.9)	2 (4.0)	
Frequency of sexual activity >6 mo				< .001*
Less	3 (75.0)	1 (3.85)	1 (2.04)	
Same	1 (25.0)	16 (61.5)	41 (83.7)	
More	0 (0.0)	9 (34.6)	6 (12.2)	
Did not engage	0 (0.0)	0 (0.0)	1 (2.0)	

* *P* value < .05.

cuff repair. Shoulder pathology may inherently lead to greater rates of sexual dysfunction.

Approximately three-fourths of patients reported that their symptoms interfered with their sexual activity for more than 6 months prior to surgery, most notably pain and paresthesia. This resulted in 65% of patients having to change sexual positions, most commonly avoiding weight-bearing and using the affected arm. This is similar to both Nugent et al[8] and Kazarian et al,[6] where nearly all patients who adjusted their sexual position refrained from weight-bearing on the affected extremity. Certain positions during sexual activity may increase pressure within the carpal and cubital tunnel, causing paresthesia and pain.[16–18] Both of these symptoms were attributed to sexual limitations within our study. To mitigate discomfort, patients frequently remained below or on top of their partner, or on their side, which may have offloaded their extremity.

After surgery, 61% of respondents noted improvement in their sexual function, specifically with ease of intercourse. This was most frequently attributed to improvements in pain and paresthesia. Resolution of these symptoms is a well-known outcome following CTR and CuTR.[19,20] However, prior to our study, it was unclear if improvement in these symptoms contributed to sexual ease. Our study also demonstrated that fewer patients adjusted their sexual position after surgery. However, of those who did change positions, most continued to avoid weight-bearing and using the affected arm during coitus.

Despite these improvements, only 15% of patients increased the frequency of their sexual activity after surgery, whereas most reported no change. This is similar to previous studies, which demonstrated an increase of 15% to 19% in the frequency of intercourse.[6,13] Although social determinants may play a confounding role, it is possible that CTR and CuTR may have a greater effect on quality rather than frequency of sexual activity.

After surgery, 32% of patients were more satisfied with their sexual function, which was most frequent among those whose upper extremity symptoms interfered with their sexual activity and required position adjustments before surgery. Those experiencing higher satisfaction engaged in sexual activity more frequently within the initial 6 weeks, which persisted to beyond 6 months following surgery. Nevertheless, most reported no change in sexual satisfaction. Postoperative satisfaction is complex and may be influenced by expectations preceding surgery and other confounders.[21,22]

The timeframe for resuming sexual activities following CTR and CuTR is unknown as most studies evaluate time to work and function rather than intercourse.[20,23,24] Our study demonstrated that 73% of patients resumed sexual activities within 3 weeks following surgery. This is quicker than patients who underwent arthroscopic rotator cuff repair, where 64% waited until after 6 weeks after surgery.[8] Nevertheless, this is not unexpected, considering that weight-bearing restrictions and adherence to a sling protocol are generally recommended following rotator cuff repairs.[25] Although early mobilization following CTR and CuTR is generally safe and effective, surgeons may advise patients that there may be a theoretical risk for injury to the incisional site or discomfort during postoperative coitus.[26–28]

To our knowledge, this is one of the first studies to assess sexual activity pre- and post-CTR and CuTR. Our study has limitations, which are mostly inherent to its survey-based design. First, the survey responses are susceptible to recall bias, considering the time lapse between symptom onset and survey completion. Second, patients may underreport sexual activity due to its personal nature, despite the survey remaining anonymous. Third, our survey answer choices may have inadvertently forced respondents to choose the closest rather than the most accurate answer. We limited this by including opportunities for open-ended responses. Fourth, we did not control for social or surgical determinants that could have confounded the results. We did not specify unilateral versus bilateral or endoscopic versus open nerve decompressions. However, prior studies demonstrate similar outcomes for open and endoscopic nerve decompressions.[29] Fifth, our study assessed sexual satisfaction using a single question. Postoperative satisfaction is complex, and therefore, further studies are needed to truly elucidate its role in sexual activity. Sixth, our response rate of 5.9% may limit the generalizability of the data. However, some emails may have been filtered into a spam folder and thus may not have been viewed by patients. Consequently, our actual survey response rate is likely higher than documented. Additionally, sexual function is a controversial topic that may inherently limit responses. Finally, patients with compressive neuropathies tend to be older; therefore, sexual function may not be extrapolated to pathologies affecting the younger population. Symptoms of carpal and cubital tunnel syndromes such as pain, paresthesia, limited strength, and motion can disrupt sexual function, causing some patients to adjust sexual positions. Surgical release can improve sexual function and maintain sexual satisfaction. This may be correlated with improved physical and mental health and overall quality of life. Further investigations are needed to provide a more comprehensive understanding of sexual function in the setting of neuropathies.

Conflicts of Interest

No benefits in any form have been received or will be received related directly to this article.

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