Effect of Monocryl versus Nylon Sutures on Patient and Observer-assessed Outcomes After Carpal Tunnel Surgery: Prospective Randomized Controlled Trial

Edward J Wu[1], Christopher Omar Bayne[2], Robert Morris Szabo[3]
[1]University of Minnesota, [2]UC Davis Healh System, [3]UC Davis Health System

INTRODUCTION: Carpal tunnel release is the most commonly performed procedure in the hand, yet controversy remains regarding the optimal technique and suture type for wound closure. The ideal method of wound closure following open carpal tunnel release would provide adequate strength during the proliferative wound healing period, cause minimal inflammatory reaction, require minimal postoperative care, and produce a good cosmetic outcome with high patient satisfaction. Surgical site complications such as dehiscence, inflammation, pain, or infection can significantly impair a patient's hand function and quality of life. Therefore, it is important to know if the choice of suture material used for skin closure can affect outcomes or reduce adverse events. We conducted a prospective, randomized controlled trial comparing the effect of absorbable Monocryl versus nonabsorbable nylon suture on wound closures and patient and observer-reported outcome scores using a validated scar assessment scale.

METHODS:

Institutional Review Board approval was obtained prior to the study. Adult patients undergoing open carpal tunnel release were randomized to receive either interrupted, buried Monocryl sutures or traditional nylon horizontal mattress sutures for their wound closures. At the 2-week and 6-week postoperative visits, Patient and Observer Scar Assessment Scale (POSAS) questionnaires were completed. Patients assessed their scars on the criteria of pain, itchiness, color, stiffness, thickness, and irregularity, while observers rated the vascularity, pigmentation, thickness, relief, pliability, and surface area of the scars. Both were asked to provide their overall opinion of the scars. Statistical analysis was performed using two-tailed t-tests.

RESULTS:

A total of 104 patients completed the first postoperative visit at 2 weeks, and 68 patients completed the second postoperative visit at 6 weeks. At 2 weeks, patients reported a statistically significant difference in thickness and irregularity between Monocryl and nylon (Table 1). Observers rated scars closed with Monocryl more favorably in every category (Table 2). Patients and observers had a significantly better opinion of Monocryl in the early postoperative period. By 6 weeks, neither patients nor observers found a difference between suture types in any category. Observers tended to report better opinions of the scars than patients regardless of suture type or timepoint (Table 3). Based on patient and observer assessments, scars closed with Monocryl did not change appreciably in appearance between 2 and 6 weeks. However, patients and observers noted significant improvement in scar appearance in the nylon group over time (Table 4). There were no surgical site complications in either group.

DISCUSSION AND CONCLUSION:

Use of interrupted, buried Monocryl sutures represents an effective method for carpal tunnel closure that leads to better early patient and observer-reported outcome scores when compared to traditional nylon suture. Although absorbable and nonabsorable sutures produce comparable scars in the long-term, our study provides level 1 evidence that patients and observers have a higher opinion of scars closed with absorbable suture during the early postoperative period when scars are healing. Absorbable sutures confer several additional advantages, including eliminating the need for suture removal or an in-person return visit, a trend that became more common during the COVID-19 pandemic.

Table 1: Patient Scar Assessment Scale Results at 2 Week and 6 Week Postoperative Visits

	2 Week Post-Op Visit			6 Week Post-Op Visit		
Category	**Monocryl**	**Nylon**	**p-value**	**Monocryl**	**Nylon**	**p-value**
Pain	3.43	3.28	0.73	3.80	3.50	0.60
Itching	2.74	3.23	0.27	3.26	3.09	0.78
Color	3.51	4.35	0.15	4.17	3.88	0.63
Stiffness	4.49	5.40	0.12	4.91	4.13	0.20
Thickness	3.83	5.33	<0.05*	4.26	3.84	0.48
Irregularity	3.63	5.28	<0.05*	3.29	3.91	0.31
Overall Opinion	3.54	5.04	<0.05*	3.77	3.69	0.87

*Statistically significant difference between Monocryl and nylon

Table 2: Observer Scar Assessment Scale Results at 2-Week and 6-Week Postoperative Visits

	2 Weeks			6 Weeks		
Category	**Monocryl**	**Nylon**	**p-value**	**Monocryl**	**Nylon**	**p-value**
Vascularity	2.51	3.13	<0.05*	2.94	3.00	0.83
Pigmentation	2.40	3.02	<0.05*	2.52	2.44	0.78
Thickness	2.76	4.04	<0.05*	3.15	2.91	0.56
Relief	2.94	3.59	<0.05*	2.58	2.66	0.84
Pliability	3.00	3.93	<0.05*	3.36	3.00	0.37
Surface Area	2.39	3.60	<0.05*	2.24	2.69	0.14
Overall Opinion	2.70	3.66	<0.05*	2.70	2.71	0.96

*Statistically significant difference between Monocryl and nylon

Table 3: Comparison of patient versus observer overall opinion for each suture type

	2 Weeks			6 Weeks		
Suture Type	**Patient**	**Observer**	**p-value**	**Patient**	**Observer**	**p-value**
Monocryl	3.54	2.70	<0.05*	3.77	2.70	<0.05*
Nylon	5.04	3.66	<0.05*	3.69	2.71	<0.05*

*Statistically significant difference in overall opinion between patient and observer

Table 4: Changes in (a) patient and (b) observer ratings for each suture type from 2 weeks to 6 weeks

(a) Comparison of patient scar assessment for each suture type from 2 weeks to 6 weeks

	Monocryl			Nylon		
Category	**2 weeks**	**6 weeks**	**p-value**	**2 weeks**	**6 weeks**	**p-value**
Pain	3.43	3.80	0.49	3.28	3.50	0.64
Itching	2.74	3.26	0.34	3.23	3.09	0.78
Color	3.51	4.17	0.28	4.35	3.88	0.45
Stiffness	4.49	4.91	0.49	5.40	4.13	<0.05*
Thickness	3.83	4.26	0.48	5.33	3.84	<0.05*
Irregularity	3.63	3.29	0.56	5.28	3.91	<0.05*
Overall Opinion	3.54	3.77	0.66	5.04	3.69	<0.05*

(b) Comparison of observer scar assessment for each suture type from 2 weeks to 6 weeks

	Monocryl			Nylon		
Category	**2 weeks**	**6 weeks**	**p-value**	**2 weeks**	**6 weeks**	**p-value**
Vascularity	2.51	2.94	0.15	3.13	3.00	0.64
Pigmentation	2.40	2.52	0.71	3.02	2.44	<0.05*
Thickness	2.76	3.15	0.32	4.04	2.91	<0.05*
Relief	2.94	2.58	0.34	3.59	2.66	<0.05*
Pliability	3.00	3.36	0.37	3.93	3.00	<0.05*
Surface Area	2.39	2.24	0.63	3.60	2.69	<0.05*
Overall Opinion	2.70	2.70	0.99	3.66	2.71	<0.05*

*Statistically significant difference in rating between 2 and 6 weeks