

Elijah G. Bingham, BS¹, Purushottam Nagarkar, MD², Nirbhay S. Jain, MD¹, Meaghan L. Barr, MD², Cathy Tang, MD³, Dong Lee, BS⁴, Irene Chang, BS⁵, Michael Delong, MD¹, Prosper Benhaim, MD⁴

¹Division of Plastic and Reconstructive Surgery, University of California Los Angeles, Los Angeles, CA, USA, ²Department of Plastic Surgery, University of Texas Southwestern Medical Center, Dallas, TX, USA, ³Division of Plastic and Reconstructive Surgery, University of California, Irvine, Irvine, CA, USA, ⁴Department of Orthopaedic Surgery, University of California Los Angeles, Los Angeles, CA, USA, ⁵Case Western Reserve University School of Medicine, Cleveland, OH, USA.

- Introduction
- Dupuytren’s disease is a relatively common condition encountered by hand surgeons. Injection of collagenase Clostridium histolyticum enzyme, followed by manual manipulation, is effective in managing Dupuytren’s disease.
 - For a variety of reasons, patients are often unable to return to clinic for manipulation within the recommended 24-72 hours from injection.
 - Therefore, we sought to study the impact of time from collagenase injection to manipulation on outcomes and post-procedure complications.

- Methods
- We performed a retrospective review of 309 patients who underwent an injection of collagenase Clostridium histolyticum enzyme for Dupuytren’s disease with manipulation at two, five, or seven days after injection
 - We compared pre-injection and post-injection contracture angles, as well as rates of skin and tendon tears
 - We then performed a multivariate regression to determine significant predictors of complications

- Results
- Of the 309 patients, 207 underwent manipulation at two days, 32 at five days, and 70 at seven days
 - Rates of skin tears (53.4% v 56.2% v 47.1%, p<.294) and tendon tears (.5% v 0% v 1.5%, p<.619) were equivalent in all three groups .
 - Significant predictors of complications included number of cords injected and history of previous collagenase injection.

	2 days (n = 207)	5 days (n = 32)	7 days (n = 70)
MCP-T	<.001	.053	.328
MCP-I	<.001	.030	<.001
MCP-M	<.001	<.001	<.001
MCP-R	<.001	<.001	<.001
MCP-S	<.001	<.001	<.001
PIP-T			
PIP-I	<.001	.011	<.001
PIP-M	<.001	<.001	<.001
PIP-R	<.001	<.001	<.001
PIP-S	<.001	<.001	<.001
DIP-I	.037		
DIP-M	.004		
DIP-R	.008		
DIP-S	<.001	.021	.011
Max at any joint	<.001	<.001	<.001

Table 1. Table showing significant change between pre-and post-operative angles at all joints regardless of day of injection.

	2 days (n = 207)	5 days (n = 32)	7 days (n = 70)	P value
Age	64.9	68.5	65.4	0.20
Sex (% Male)	74.9	68.8	77.1	0.66
Handedness (% R)	84.5	87.5	88.6	0.68
FHx of Dupuytren (% yes)	34.3	34.4	41.4	0.55
Hand Involved (% R)	49.8	56.3	47.1	0.69
Diabetes (% Yes)	6.8	21.9	5.7	< 0.05
Hx Dupuy Sx (% Yes)	27.1	21.9	14.3	0.09
Hx Collagenase Inj (% Yes)	10.6	6.3	5.7	0.39
Total Cords per pt	12.6	13.8	12.7	0.08
Number of Cords (%)				0.08
0-10	21.7	6.3	20	
10-15	56.5	78.1	67.1	
> 15	21.7	15.6	12.9	
Groups of angles by deg (%)				0.24
0-20	9.7	3.1	11.4	
20-40	32.4	12.5	27.1	
> 40	58	84.4	61.4	
Postop tendon rupture (% yes)	0	0	0	---
Postop skin tears (% yes)	53.4	56.2	47.1	0.29

Table 2. Preoperative and postoperative demographic data of patients in the study

- Discussion
- We found that improvement in contracture was independent of time from injection to manipulation. Our data convincingly demonstrate that this type of manipulation is not affected by early proliferative phase fibroblast-mediated collagen deposition.
 - Similarly, time to manipulation did not affect the rate of complication, specifically skin tears, as results were equivalent at 2, 5, and 7 days.
 - Interestingly, having more than 10 cords and a history of Xiaflex injury both result in increased skin tears. These findings also make mechanistic sense. Typically, more cords mean more Xiaflex used, resulting in weakening of the dermis and increase chances for skin tears.
 - For patients with history of Xiaflex, there is a 50% chance of previous skin tear; scar tissue at the site of a previous skin tear is weaker and more susceptible to repeat tearing.
 - These data suggest that manipulation can be delayed up to a week after injection for patient or surgeon convenience without fear of negative outcomes.

- Conclusions
- Collagenase injection for Dupuytren’s disease is typically performed with plans for manipulation at 24-72 hours.
 - In this study, we demonstrate post-injection manipulation could be performed at seven days without adversely impacting postoperative contracture angles or rates of skin and tendon complications