Collagenase Extensor Tenotomy for Boutonniere Deformity in Dupuytren Disease

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BACKGROUND

Dupuytren contracture with Boutonniere deformity is a difficult problem in hand surgery which his particularly resistant to treatment. Boutonniere deformity is characterized by flexion of the proximal interphalangeal (PIP) joint and hyperextension of the distal interphalangeal (DIP) joint. Hyperextension of the DIP joint in Dupuytren disease may be through pathological involvement of the transverse retinacular ligaments pulling the lateral bands volarly, or a secondary effect of PIP joint contracture, which creates an imbalance in the flexor and extensor tendons as they act across the DIP joint with progressive overstretching of the DIP joint volar plate. Boutonniere deformity may be treated with open tenotomy, or has been released with needle tenotomy

STUDY AIMS

In addition to these approaches, we describe the use of collagenase clostridium histolyticum as a treatment methodology. We aimed to retrospectively review a single surgeon experience using collagenase for treatment of Dupuytren Boutonniere deformity in 13 patients.

METHODS

•Charts reviewed for:

- •Pre- and post-treatment active range of motion at the MCP, PIP, and DIP joint
- •Pre -and post-treatment flexion/extension contracture at the MCP, PIP, and DIP joint

Demographics

13 patients treated,12 patients with small finger, 1 with ring finger involvement. Average preoperative flexion contracture at the MCP joint 30 degrees, at the PIP joint 70 degrees, and average DIP joint hyperextension 27 degrees. Preoperative arc of motion at the MCP, PIP, and DIP joints were 69, 22, and 29 degrees, respectively.

Patient #	Age	Sex	Affected digit	Previous Treatments	Preoperative ROM MCP	PIP	DIP
1	57	M	L Small	Surgery x 2, Digit Widget, NA	90	30	20
2	67	M	R Small	Surgery	95	5	55
3	67	M	R Small	Surgery, NA	75	50	35
4	63	M	R Small	NA	90	25	30
5	82	M	L Small	Surgery	90	10	5
6	59	M	R Small	Surgery x 2	50	35	25
7	65	M	L Small	NA, Collagenase	90	20	15
8	61	M	L Ring		60	15	20
9	62	M	L Small	Surgery, NA	75	5	10
10	78	M	R Small		60	30	5
11	65	F	L Small		15	10	50
12	79	M	L Small	NA	20	15	45
13	67	F	R Small		90	40	55

Surgical Treatment

Patients received a single treatment with injection of collagenase at the MCP joint, PIP joint and DIP joint. A dose of 0.5-1mg was used at the PIPJ. A dose of 0.1mg of collagenase was used for injection at the DIP joint

RESULTS

Average postoperative flexion contracture at the MCP joint was 12 degrees (P>0.05), and average PIP joint flexion contracture was 48 degrees (P<0.05). Average DIP joint hyperextension deformity was 9 degrees (P<0.05). The average postoperative arc of motion at the MCP, PCP, and DIP joint was 80 degrees (P>0.05), 45 degrees (P<0.05), and 36 degrees (P>0.05). This correlates to improvement in arc of motion on average of 11 degrees at the MCP joint, 23 degrees at the PIP joint, and 7 degrees at the DIP joint. Average length of follow up was 5.7 months.

RESULTS

Patient #	Pre-operative Flexion/Extension Deficit MCP	PIP	DIP	Post-operative Flexion/Extension Deficit MCP	PIP	DIP
1	0	60	20	0	40	10
2	0	85	45	0	75	0
3	15	45	5	5	60	0
4	0	70	30	20	40	10
5	5	85	20	0	45	15
6	55	55	10	40	60	10
7	0	85	10	0	15	0
8	30	90	15	0	60	25
9	20	75	60	20	40	15
10	30	45	25	35	35	15
11	75	85	50	15	35	0
12	70	70	45	25	60	10
13	90	55	20	0	60	5

CONCLUSION

Collagenase injection at the PIP and DIP joint led to statistically significant improvement in the degree of joint contracture, and statistically significant improvement in the arc of motion at the PIP joint, with a trend toward significance in the MCP and DIP joint arc of motion. While collagenase has been previously used for flexion contractures in Dupuytren disease, we believe it has a role in treating DIP joint hyperextension deformity associated with Boutonniere in Dupuytren disease as well.

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