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WHAT IS THE BETTER TREATMENT FOR SINGLE DIGIT DUPUYTREN'S CONTRACTURE: SURGICAL RELEASE OR COLLAGENASE CLOSTRIDIUM HISTOLYTICUM (XIAPEX) INJECTION?

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ABSTRACT

The purpose of this study was to compare the initial and final outcome range of motion in the MCP-J and PIP-J of single digit Dupuytren's Contracture treated with either open surgical excision or manipulation after collagenase clostridium histolyticum (CCH; Xiapex) injection. Material: Ten patients in either group. The range of motion measurements were statistically compared using the student *t*-test with a *p*-value of 0.05. There was no statistical difference in the pre-treatment status of the total active range of movement (TAM) between the two groups. Results: Open surgical release achieved a statistically better initial outcome in combined total passive range of movement than the xiapex group ($p = 0.0047$), but at the final outcome the better TAM measurement at the MCP-J after surgery was not statistically significant. However, the total active range of movement was statistically better at the PIP-J level in the xiapex group ($p = 0.01$) and the MCP-J and PIP-J combined total active range of movement was statistically better in the xiapex group ($p = 0.0258$). Conclusion: Surgery achieved better initial outcome at both MCP-J and PIP-J levels, and at discharge, only extension in the MCP-J level was statistically better after open excision. However the final outcome was statistically better at the PIP-J level in extension ($p = 0.006$) and total active movement (TAM) ($p = 0.008$) after treatment with collagenase clostridium histolyticum. Further studies are required to assess the long-term differences between the two groups and to investigate the outcomes for patients with multi-digit involvement.

Keywords: .

INTRODUCTION

The gold standard for Dupuytren contracture treatment is surgical excision of the cord and the technique has remained the same for many decades.[1] However, though collagenase clostridium histolyticum (CCH) injection treatment was reported more than a decade ago[2] only recently has it been released for use in the United Kingdom under the name of Xiapex.[3] Though there are numerous studies that have reported on outcomes after surgical treatment, none have compared the final outcome of surgical excision with CCH injection treatment performed by the same surgeon. This study therefore aimed to compare the initial and final outcomes of single digit Dupuytren's contracture treated with either open surgical release or manipulation after CCH; Xiapex injection by the same surgeon.

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METHODS

Patients referred for treatment of Dupuytren's contracture were included in this study if they fulfilled the criteria similar to the JOINT I and II studies[4] and only had one finger involvement, index to little finger. All patients were offered a choice between conventional open excisions or a single injection of 0.56 mg CCH administered in day surgery followed by outpatient manipulation of the cord under local anaesthetic three days later. Prospective data were collected from 10 consecutive patients with single digit Dupuytren's contracture who had undergone open fasciotectomy and 10 patients with single digit Dupuytren's contracture who had undergone manipulation after CCH injection (0.56 mg *C. histolyticum* collagenase).[5] Our local audit and ethics committee had approved an audit comparing treatment with open surgery and CCH injection for Dupuytren's contracture.

Material: The pre-treatment active range of movement measurements of the included patients are found in Table 1. Pre-treatment status and digit side, number, and joint are also recorded.

All patients were treated by the same surgeon in a dedicated day surgery unit; open procedures were all performed under general anaesthetic. At surgery, a Brunner incision was used for the skin and the whole fibrous band was removed. The patients were placed in a cast in full extension until they were seen five days later in the out-patient department for dressing change and started hand therapist supervised rehabilitation, involving provision of a night splint custom-made by a hand therapist,

Table 1 Range of Movement After Xiapex or Open Treatment of Dupuytren's Contacture.

			Pre-Treatment Status							Initial Outcome							Final Outcome						
			MCP			PIP			COMB.	MCP			PIP			COMB.	MCP			PIP			COMB.
XIAPEX	Side	Digit	Flex	Ext	TAM	Flex	Ext	TAM	TAM	Flex	Ext	TPM	Flex	Ext	TPM	TPM	Flex	Ext	TAM	Flex	Ext	TAM	TAM
1	L	4	90	−30	60	110	−30	80	140	90	−20	70	90	−18	72	142	90	−6	84	96	0	96	180
2	R	4	90	−35	55	110	0	110	165	90	−4	86	100	0	100	186	90	−4	86	110	0	110	196
3	L	4	90	0	90	110	−45	65	155	90	0	90	100	0	100	190	90	0	90	104	0	104	194
4	R	5	90	−25	65	110	0	110	175	90	0	90	110	0	110	200	90	0	90	90	−8	82	172
5	L	3	90	0	90	110	−30	80	170	90	0	90	95	0	95	185	90	0	90	104	4	108	198
6	R	4	90	−20	70	110	0	110	180	90	0	90	110	0	110	200	90	0	90	102	0	102	192
7	R	4	90	−30	60	110	0	110	170	90	0	90	108	0	108	198	90	0	90	108	0	108	198
8	L	5	90	0	90	110	−40	70	160	90	0	90	110	0	110	200	96	12	108	90	0	90	198
9	L	5	90	−30	60	110	0	110	170	90	0	90	106	0	106	196	90	0	90	114	0	114	204
10	L	5	90	−30	60	110	−35	75	135	90	−12	78	100	−18	82	160	90	0	90	104	−2	102	192
Mean			90	−20	70	110	−18	92	162	90	−4	86.4	103	−4	99.3	185.7	90.6	0.2	90.8	102	−1	102	192.4

			Pre-Treatment Status							Initial Outcome							Final Outcome						
			MCP			PIP			COMB.	MCP			PIP			COMB.	MCP			PIP			COMB.
OPEN	Side	Digit	Flex	Ext	TAM	Flex	Ext	TAM	TAM	Flex	Ext	TPM	Flex	Ext	TPM	TPM	Flex	Ext	TAM	Flex	Ext	TAM	TAM
1	R	5	100	−30	70	110	0	110	180	90	0	90	110	0	110	200	98	20	118	96	−18	78	196
2	L	5	90	0	90	110	−40	70	160	90	0	90	110	0	110	200	90	14	104	90	−30	60	164
3	L	2	90	−20	70	110	−30	80	150	90	0	90	110	0	110	200	94	0	94	96	−18	78	172
4	L	5	90	0	90	110	−40	70	160	90	0	90	110	0	110	200	90	0	90	95	0	95	185
5	R	5	90	−30	60	110	0	110	170	90	10	100	110	0	110	210	92	14	106	20	0	20	126
6	R	4	90	20	110	110	−45	65	175	90	20	110	110	0	110	220	90	10	100	98	−18	80	180
7	R	5	90	−30	60	110	−10	100	160	90	10	100	110	0	110	210	82	8	90	102	−6	96	186
8	L	5	90	−20	70	110	−45	65	135	90	10	100	110	0	110	210	90	0	90	100	−8	92	182
9	L	5	90	0	90	110	−30	80	170	90	20	110	110	0	110	220	78	26	104	100	−16	84	188
10	R	2	90	−20	70	110	0	110	180	90	20	110	110	0	110	220	84	0	84	84	4	88	172
Mean			91	−13	78	110	−24	86	164	90	9	99	110	0	110	209	88.8	9.2	98	88.1	−11	77.1	175.1

supervision of mobilisation, and wound management on a needs basis.

The CCH treated patients were injected, without anaesthetic cover, in our day case unit with injection placement along the fibrous band and post-injection observation following the manufacturer's recommendation.[3] The CCH treated patients were seen three days later in the outpatient department, where they underwent a manipulation of the cord under local anaesthetic. After the manipulation they followed a similar rehabilitation programme as the surgically treated patients involving provision of a night splint custom-made by a hand therapist, supervision of mobilisation, and wound management on a needs basis.

All patients were rehabilitated up until discharge by a dedicated hand therapist who measured the active range of motion outcome. Statistical analysis of the results was evaluated using the student *t*-test with a significance value of 0.05.

RESULTS

The first section shows the *pre-treatment status* of the contractures in the MCP-J and PIP-J and the active range of movement for all patients, and the total active range of movement (TAM) was calculated (Table 1). There was no statistical diference between the groups.

The second section of Table 1 shows the passive measurements obtained initially after the two interventions — *Initial outcome*. For the surgical group this was recorded by the surgeon before application of the cast during surgery, and for the CCH group this was recorded by the hand therapist initially after manipulation under anaesthesia by the surgeon.

The last section of Table 1 shows the measurements at discharge — *Final outcome.* When comparing the final measurements between the two treatment groups, it was seen that the best TAM at the MCP-J level was achieved in the surgical group, with the extension statistically better ($p = 0.017$) than the injection group. For the best TAM at the PIP-J level, the injection treatment was statistically better ($p = 0.01$). The xiapex group also achieved the best combined TAM ($p = 0.0258$).

DISCUSSION

Though a recent paper has shown good long-term outcome of Xiapex injection for Dupuytren's contracture[6] there are no studies comparing this with patients treated with open surgical release by the same surgeon and receiving a similar rehabilitation programme. Furthermore, there is no comparative data on how the measurements of passive correction, obtained immediately after open surgical release or post-collagenase manipulation for patients with Dupuytren's contracture, translate into active range of motion for these two groups of patients at the time of discharge. The current study is therefore a valuable contribution to the knowledge of treatments of Dupuytren's contracture and the short- and longer-term effects, though the authour accepts that the presented material is small and only contains patients with single digit contractures. However, the strength of this study is that all patients, both in the open release and the CCH treated group were treated by the same surgeon and all patients in both groups received the same rehabilitation programme in the same department.

Table 1 shows that in the *pre-treatment status* the two groups were not statistically different regarding the TAM. However, the *Initial outcome* section in Table 1 shows that the open surgery group achieved a more impressive *total passive range of movement (TPM)* than what was achieved with a single CCH injection, but that this head start was mostly lost by the time that the patients were discharged as seen in section *Final outcome* in Table 1.

The present cohort of CCH treated patients present a very different progress compared with those surgically treated. The initial improvement is less impressive in the CCH group compared with the surgically treated patients both at the MCP-J and the PIP-J level, however, this is reversed particularly at the PIP-J level as the xiapex group's TAM is statistically larger ($p = 0.01$) at the *Final outcome* measure. Furthermore, the combined MCP-J and PIP-J TAM, as seen in Table 1, is also better in the Xiapex group at the final outcome compared with the open group ($p = 0.0258$).

CONCLUSION

Whilst surgery achieved a better initial outcome at both MCP-J and PIP-J levels, and at discharge only, achieved statistically better measurements of extension in the MCP-J level, the "final outcome" was statistically better at the PIP-J level in extension ($p = 0.006$) and TAM ($p = 0.008$) after treatment with CCH injection. Further studies are required to assess the long-term differences between the two groups and to investigate the outcome for patients with multi digit involvements.

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