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Correlation of US Finding and Therapeutic Outcome in Adhesive Capsulitis: Preliminary study

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Background

Adhesive capsulitis (AC) in shoulder is a common clinical condition causing pain and functional impairment. Diagnosis of AC is usually made on the basis of clinical findings and ultrasonography (US) has only been used to exclude other pathologies. Specific parameters on US such as coracohumeral ligament (CHL), axillary recess (AR) and rotator interval (RI) thickness are known to be increased in adhesive capsulitis. However, there have been few studies on the relationship with clinical findings and no study investigated the relationship between US parameters and treatment effect of intra-articular (IA) injection in glenohumeral joint.

Purpose

To investigate the correlation between US parameters in patients with AC of shoulder and clinical impairments as well as treatment effect of IA injection.

Participants

Patients with clinically diagnosed unilateral AC were recruited in Kangbuk Samsung hospital from November 2017 to June 2018. Diagnosis of adhesive capsulitis was made according to three criteria; (i) pain in unilateral shoulder, (ii) feeling of shoulder stiffness, (iii) limitation of passive and active range of motion in capsular pattern. Patients were excluded if they had any of the followings; (i) rotator cuff tear (ii) calcification in rotator cuff (iii) history of trauma or operation.

Method

Ultrasonography was performed and thickness of AR, CHL and RI were evaluated. Clinical symptom was assessed using numeric rating scale for pain (NRS) and shoulder pain and disability index (SPADI), subdivided by SPADI pain score and disability score. All patients received US-guided IA injection in glenohumeral joint with triamcinolone 20mg + normal saline 6cc. After 1 month from initial evaluation and IA injection, NRS and SPADI were reassessed and improvement in score was calculated to evaluate treatment effect of injection. We analyzed whether US findings correlated with clinical symptoms and/or treatment effect of intra-articular injection.

Results

14 patients were included. The mean age was 56.86±8.51 years and fifty percent of patients were male. The mean duration of symptom was 22.29±16.58 weeks. The average NRS was 6.36±1.82. The thickness of AR and CHL were significantly higher in the affected

shoulder than in the unaffected one (p<0.05). None of the US parameters was correlated with initial NRS and SPADI. In analysis of correlation of US parameters and treatment effect of IA injection, AR thickness was significantly correlated with improvement in SPADI total score and SPADI disability subscale score (p=0.02).

Conclusion

Based on the Result of this study, US parameters do not seem to reflect severity of clinical symptom in patients with AC. However, the AR thickness appears to be associated with treatment effect of intra-articular injection whichcould reflect degree of inflammation. Further investigation is needed to explore the role of US parameters as a predictor of intra-articular injection effect.

Age (year)	56.86±8.51
Sex; male (%)	50
DM (%)	42.9
HTN (%)	35.7
Thydoid disease (%)	7.1
Heart disease (%)	7.1
Symptom duration (weeks)	22.29±16.58
NRS	6.36±1.82
SPADI_pain (%)	59.36±24.74
SPADI_disability (%)	54.89±23.85
SPADI_total (%)	56.56±22.99

DM; diabetes mellitus

Demographics & clinical findings of study

	NRS		SPADI(pain)		SPADI(disability)		SPADI(total)	
	Spearman's rho	p-value	Spearman's rho	p-value	Spearman's rho	p-value	Spearman's rho	p-value
Axillary recess thickness (mm)	-0.396	0.161	-0.215	0.460	-0.012	0.967	-0.098	0.739
CHL thickness (mm)	-0.271	0.370	-0.447	0.126	-0.025	0.936	-0.195	0.522
Rotator interval thickness (mm)	-0.268	0.377	-0.221	0.468	-0.108	0.726	-0.161	0.598

Correlation between US parameters and functional impairment

	NRS_Imp		SPADI(pain)_Imp		SPADI(disability)_Imp		SPADI(total)_Imp	
	Spearman's rho	p-value	Spearman's rho	p-value	Spearman's rho	p-value	Spearman's rho	p-value
Axillary recess thickness (mm)	0.626	0.071	0.53	0.142	0.792	0.011	0.741	0.022
CHL thickness (mm)	0.479	0.192	-0.113	0.772	-0.398	0.288	-0.307	0.421
Rotator interval thickness (mm)	0.239	0.535	0.07	0.858	0.167	0.668	0.137	0.726

Imp; improvement

Correlation between US parameters and treatment effect of IA injection