Methods: A prospective cohort study was performed on 294 sites in 276 patients with functional loss due to RA scheduled to undergo primary elective surgery between October 2012 and September 2014. There were 99 sites in 96 patients (males: 10, females: 86) whose disease activity was REM or LDA just before surgery. In the REM/LDA group, the average age was 63 (29–82) years, and the average disease duration was 17 (2–60) years. The surgical site was the shoulder in 1 patient, elbow in 7, wrist in 21, hand in 24, hip in 5, knee in 10, ankle in 4, and forefoot in 27. The procedures performed included 38 alloarthroplasties, 41 arthroplasties without prosthesis, 19 arthrodesis, and 9 synovectomies. The patient-reported outcome (PRO) was assessed using the Health Assessment Questionnaire-Disability Index (HAQ-DI), EuroQol-5 Dimensions (EQ-5D), Beck Depression Inventory-II (BDI-II), Patient's General Health using visual analogue scale of 100 mm (Pt-GH), and the Disabilities of the Arm, Shoulder and Hand (DASH) for the upper extremity surgery. The Time Up &Go test (TUG) was administered for patients receiving lower extremity surgery. The disease activity was assessed based on the 28-joint Disease Activity Score using C reactive protein (DAS28-CRP). All of these items were investigated just before surgery (baseline) and again at 6 and 12 months after surgery.

Results: On the whole, the physical function (HAQ-DI, DASH, TUG), QOL (HAQ-DI, EQ-5D, Pt-GH), mental wellness (BDI-II, Pt-GH), and disease activity (DAS28-CRP)[1)] were significantly improved at 6 and 12 months after surgery compared to baseline ($p<0.01$). In the REM/LDA group, a significant improvement was noted in the physical function (DASH, TUG) and QOL (EQ-5D) at 6 and 12 months after surgery; however, we did not observe any significant changes in any other items (Table 1).

Table 1: Outcome of combination therapy with medication and orthopedic surgical intervention

		HAQ-DI	EQ-5D	BDI-II	Pt-GH mm	DASH (UE)	TUG (LE) sec	DAS28-CRP
Total n=276 (UE: n=151, LE: n=125)	baseline	1.08 (0.74)	0.69 (0.11)	13.0 (8.7)	39 (25)	43.8 (22.2)	13.0 (9.5)	3.1 (1.0)
	PO# 6mos.	1.00** (0.78)	0.74** (0.14)	11.7** (8.2)	26** (21)	37.3** (29.1)	10.5** (5.4)	2.4** (1.5)
	PO# 12mos	0.98** (0.78)	0.75** (0.14)	11.6** (8.5)	27** (21)	36.2** (23.0)	10.7** (7.0)	2.4** (0.8)
REM+LDA n=96 (UE: n=50, LE: n=46)	baseline	0.84 (0.63)	0.73 (0.13)	11.0 (8.1)	18 (18)	35.2 (20.9)	9.8 (3.2)	2.1 (0.4)
	PO# 6mos.	0.81 (0.67)	0.79** (0.15)	9.9 (7.7)	18 (16)	30.2** (18.9)	9.0** (2.6)	1.9** (0.6)
	PO# 12mos	0.83 (0.70)	0.79** (0.16)	10.1 (8.1)	18 (18)	29.9** (20.3)	9.0** (3.0)	1.9 (0.6)

Mean(SD), **: p<0.01 compared to baseline

Conclusions: Achieving REM or LDA is not the ultimate goal of treatment for patients with functional loss caused by structural damage. Further "wellness" can be achieved by surgical intervention. Intensive combination therapy with medication and orthopedic surgical intervention is effective in improving the QOL and mental health as well as the physical function. Such intervention can also ameliorate the disease activity.

References:

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AB0220 THE PROMISE OF ULTRASOUND GUIDED MINIMALLY INVASIVE SYNOVIAL BIOPSIES IN THE UNITED STATES

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Background: Currently we are in the golden age of therapy for patients with rheumatoid arthritis (RA). However, currently there exists no available assay to predict the response to a particular therapy for an individual patient. Today, rheumatologists do not have information at han for therapeutic decisions. It is clear that the target organ in RA patients, i.e. the synovium, has the potential to unlock the secret for determining therapeutic response. Ideally, a sufficient synovial sample would be obtained from each patient to perform histology, sorting of individual cell populations and transcriptional analyses.

Objectives: Our goal is to establish a minimally invasive ultrasound guided synovial biopsy program in the United States to obtain synovial tissue for determining therapeutic response.

Methods: Rheumatologists from six Universities in the United States were trained in ultrasound guided minimally invasive synovial tissue biopsy procedures. Only patients with a grey scale synovitis score of 2 or greater were selected. A disposable semi-automatic-guillotine type biopsy needle (Quick-Core) was utilized for all patients and 25/26 patients had the biopsy performed on the wrist. Histology was performed on whole tissue. RNA was extracted from whole tissue and from FACS sorted macrophages in order for RNA sequencing (RNA-seq) analysis to be performed.

Results: Our group has already performed over 26 minimally invasive ultrasound guided synovial tissue biopsies on RA patients with active disease. We had minimal adverse effects and patients tolerated the procedure very well. At least 6–12 needle biopsies of synovial tissue were obtained via biopsy per patient. A minimum of 4 needle biopsies were placed in formalin and synovial lining was confirmed via histologic analyses. The remaining pieces were used to prepare libraries for RNA-seq. We observed comparable RNA integrity numbers, a measure of RNA quality, between the whole synovial tissue from RA (biopsy obtained) and OA (surgically-obtained) patients. OA patients segregated together transcriptionally, while RA patients are more heterogeneous as demonstrated via RNAseq analysis. We also optimized a protocol for digestion of synovial tissue biopsies for isolation of macrophages. We identified genes differentially associated with macrophage activity in RA versus OA synovial macrophages that were not evident in the whole tissue transcriptional profile.

Conclusions: Ultrasound guided synovial tissue biopsies are feasible in the United States. Based on our recent success using minimally invasive ultrasound guided synovial biopsies, we believe that this procedure coupled with cutting-edge technologies will provide the critical information to rheumatologists to establish precision based medicine as a reality for RA patients.

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AB0221 IMPACT OF SMALL TO MEDIUM DOSE OF PREDNISOLONE ON BONE MINERAL DENSITY AMONG EARLY RHEUMATOID ARTHRITIS PATIENTS

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Background: Recent randomized trials in rheumatoid arthritis (RA) using low to medium dose of corticosteroid showed that bone mineral density (BMD) loss over 2 years was not significantly different from that with placebo. Another study in early RA and undifferentiated arthritis even showed a positive correlation between cumulative glucocorticoid (GC) dose with an increase in BMD at the ultradistal forearm. Whether the use of prednisolone (pred) can prevent bone loss in early RA patients remained controversial.

Objectives: The aim of this study was to investigate the impact of small dose pred (≤10mg/day) on BMD in early RA patients.

Methods: Data from 107 patients ((age: 53.3±11.92 years; females: 79 [73.8%], median disease duration at entry: 7-month (IQR, 4–12)) from the Hong Kong early arthritis registry (Clinical Rheumatology Systematic Treat to Target in Asia Leadership [CRYSTAL] project)were analyzed. In this register, clinical and treatment information were recorded systematically, including cumulative GC dose. Hip, spine and forearm BMDs were measured by duel-energy X-ray absorptiometry (DXA) at baseline and month 12. Patients were categorized into three groups according to pred use (never/<3/≥3 months) during the first year of follow-up. Patients who ever took>10mg/day of pred were excluded. The change in BMD was compared between groups and between the two time points.

Results: The baseline characteristics of patients were shown in Table 1. Patients

Table 1. Baseline characteristics

	Duration of pred use			
	Never (n=58)	<3 months (n=8)	≥3 months (n=41)	*p*
Female	46 (79.3%)	5 (62.5%)	28 (68.3%)	0.249
Age (years)	50.66±11.86	48.25±16.4	57.61±10.24	0.004
BMI (kg/m^2)	22.80±3.56	22.27±2.19	23.55±3.84	0.496
RF+ve	46 (79.3%)	6 (75.0%)	32 (80.0%)	0.950
AntiCCP+ve	41 (83.7%)	4 (80.0%)	31 (83.8%)	0.976
Osteoporosis	14 (24.1%)	2 (25.0%)	14 (34.1%)	0.540
Disease duration	10.80±11.41	7.49±3.99	6.73±6.11	0.032
Tender joints	6.77±5.19	6.25±4.17	9.85±7.92	0.218
Swollen joints	4.05±3.70	4.13±2.85	5.98±5.17	0.146
ESR (mm/1st hr)	56.93±35.62	40.75±18.97	62.20±35.72	0.387
CRP (mg/L)	15.18±21.68	14.8619.56	27.31±34.77	0.265
DAS-CRP	4.28±1.20	4.40±1.03	4.95±1.41	0.042
DAS remission	3 (5.3%)	0 (0.0%)	2 (4.9%)	0.436
Pred	0 (0.0%)	5 (62.5%)	25 (61.0%)	<0.001
Osteoporotic drug	0 (0.0%)	0 (0.0%)	2 (5.6%)	0.172
DMARDS	30 (54.5%)	4 (57.1%)	13 (36.1%)	0.332
Biologics	0 (0.00%)	0 (0.00%)	0 (0.00%)	–
NSAID	40 (72.7%)	5 (71.4%)	28 (77.8%)	0.766