

ONLINE SUPPLEMENTARY MATERIAL

Supplementary Data 1.

Table 1. The OMERACT Ultrasound Scanning Methods in Knee Osteoarthritis

Scoring for	Range	Location	Patient Position	Scanning Plane
Synovitis	0-3	Suprapatellar recess	Supine with the knee flexed 30°	Longitudinal (lateral to medial)
		Medial and lateral parapatellar recess	Supine with the knee in a neutral position	Transverse (proximal to distal)
Synovial hypertrophy	Each for 0-1	Suprapatellar recess	Supine with the knee flexed 30°	Longitudinal (lateral to medial)
Effusion		Medial and lateral parapatellar recess	Supine with the knee in a neutral position	Transverse (proximal to distal)
Synovial PD signal				
Cartilage damage	0-3	Trochlear cartilage	Supine with full flexion of the knee.	Transverse (lateral to medial)
Meniscal damage	0-2	medial horn of the medial meniscus	supine with the knee flexed 10°	longitudinal
Osteophytes	0-3	Medial and lateral femorotibial space	supine with the knee flexed 10°	longitudinal

PD=Power Doppler

Modified from the original table with permission from Wolters Kluwer Health, Inc.⁴

Table 2. Definitions of OMERACT Grading of Ultrasound Pathologies in Knee Osteoarthritis

Pathology	Grade 0	Grade 1	Grade 2	Grade 3
Synovitis	no synovitis	minimal distension of the recess by abnormal internal hypoechoic or anechoic (relative to subdermal fat tissue) material	moderate distension or enlargement of the recess by abnormal internal hypoechoic or anechoic (relative to subdermal fat tissue) material with flat or concave superficial limit	severe distension or enlargement of the recess by abnormal internal hypoechoic or anechoic (relative to subdermal fat tissue) material with bulging superficial limit
Synovial hypertrophy	No synovial hypertrophy	Abnormal hypoechoic (relative to subdermal fat, but sometimes may be isoechoic or hyperechoic) intraarticular tissue that is non displaceable and poorly compressible and which may exhibit Doppler signal > 4mm		
Effusion	No effusion	Abnormal hypoechoic or anechoic (relative to subdermal fat, but sometimes may be isoechoic or hyperechoic) intraarticular material		

		that is displaceable and compressible, but does not exhibit Doppler signal >4mm		
Power Doppler	no colour was observed in the synovium	single colour signals were observed (up to 3) in the synovium		
Cartilage	normal	irregularities or loss of sharpness of superficial and/or deep cartilage margins without thinning	partial or complete loss of thickness of the cartilage in one trochlear facet	partial or complete loss of thickness of the cartilage in both trochlear facets
Meniscal extrusion	hyperechoic triangle with the outer edge at the level of the femorotibial joint space	hyperechoic triangle protruded, ie, partially out of the femorotibial joint space	hyperechoic triangle extruded, ie, completely out of the femorotibial joint space	
Osteophyte	no osteophytes, i.e. a smooth cortical surface.	small and distinct cortical protrusion(s) of the bony surface.	larger protrusion(s) of the bony surface.	very large protrusion(s) of the bony surface

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Supplementary Data 2.

Table 1. MRI sequences for RESTORE knee study using knee coil.

MRI Sequence	Slices	Slice thickness (mm)	Slice Gap (mm)	Phase Encoding	Scan time	lpat	Resolution	Turbo Factor (TSE)	Voxel size	TR	TE	Averages (NSA)	Bandwidth	Fat Sat
PD FS Sag	40	2.2	0.2	H>F	2.36	2	307x384	7	0.4x0.4 x2.2	3500	38	2	200	Yes
Ax PD FS	40	2.5	0.3	R>L	3.12	2	384x278	7	0.4x0.4 x2.5	4170	30	2	221	Yes
PD Cor	40	2.5	0.3	R>L	1.59	2	358x448	7	0.3x0.3 x2.5	3300	38	1	222	No
PD FS Cor	40	2.5	0.3	R>L	1.59	2	307x384	7	0.4x0.4 x2.5	3600	36	1	224	Yes
T1 3D Gradient DESS Sag	192	0.6		A>P	6.32	2	265 95%phase 90%slice	-	Acq & Rec 0.66x0. 63x0.66	14.10	5	2	250	Yes

Ax=Axial; Cor=Coronal; MRI=Magnetic resonance imaging; PD=proton density; FS=fat saturation; DESS=Dual echo steady state; Sag=Sagittal; TE= Echo time; TR=Repitition time; TSE= Turbo spin echo

Supplementary Data 3.

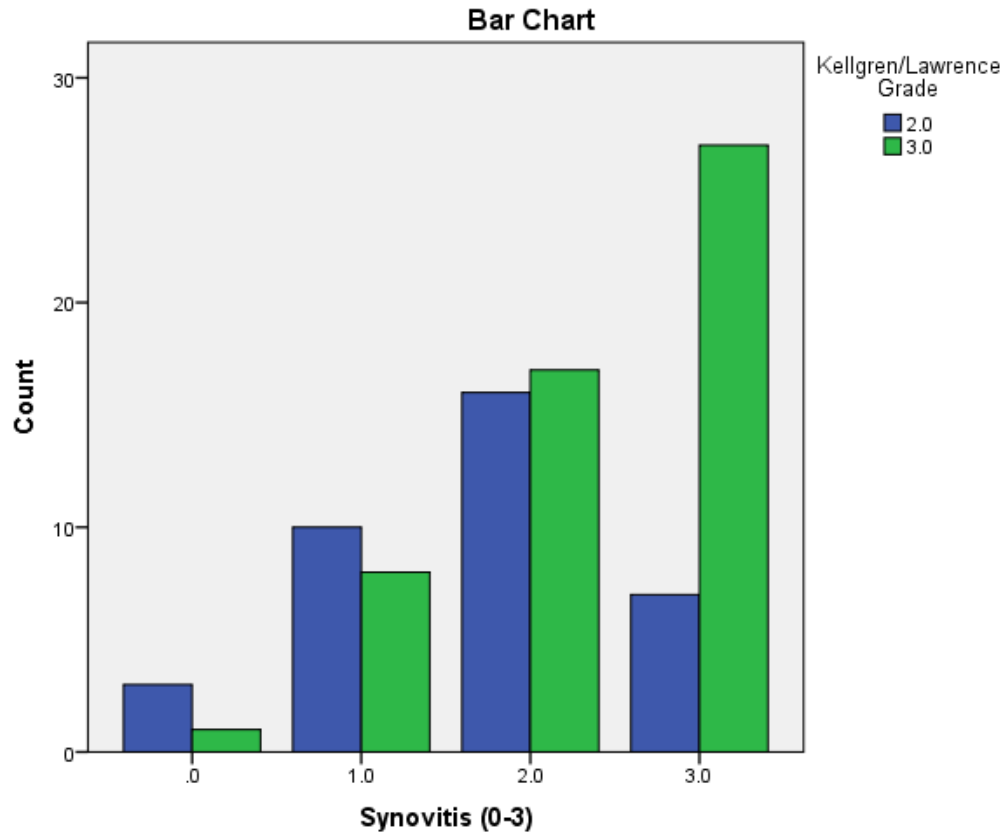
Table 1. The intra-reader and inter-reader reliability of MOAKS score in knee OA

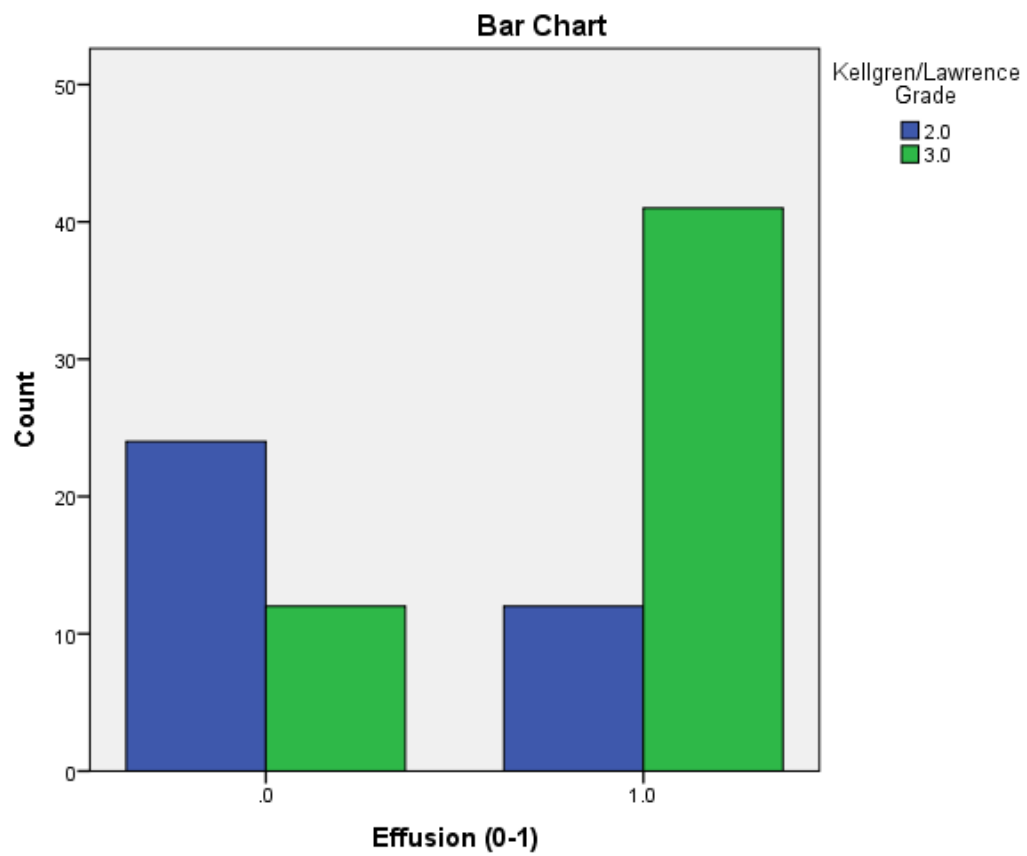
MOAKS	Intra-rater reliability (Kappa)	Percent agreement	Inter-rater reliability (Kappa)	Percent agreement
Cartilage Area F	0.82(0.46 to 1.00)	90	0.77(0.30 to 1.00)	90
Cartilage Area T	0.64(0.30 to 0.98)	80	0.42(-0.01 to 0.85)	70
Cartilage Area P	0.89(0.68 to 1.00)	90	0.90(0.75 to 1.00)	90
Cartilage Depth F	0.90(0.71 to 1.00)	90	0.69(0.39 to 1.00)	70
Cartilage Depth T	0.66(0.37 to 0.94)	60	0.53(0.21 to 0.85)	50
Cartilage Depth P	0.67(0.36 to 0.97)	60	0.60(0.24 to 0.97)	60
MME	0.92(0.75 to 1.00)	90	0.83(0.62 to 1.00)	80
LME	0.68(0.24 to 1.00)	80	0.26(-0.06 to 0.58)	80
Osteophyte F	0.69(0.33 to 1.00)	80	0.77 (0.30 to 1.00)	80
Osteophyte T	0.66(0.31 to 1.00)	70	0.45(0.09 to 0.82)	60
Osteophyte P	0.79(0.54 to 1.00)	80	0.63(0.22 to 1.00)	80
effusion synovitis	0.91(0.74 to 1.00)	90	0.80(0.56 to 1.00)	80
Hoffa synovitis	0.83(0.55 to 1.00)	90	0.50(0.044 to 0.96)	70

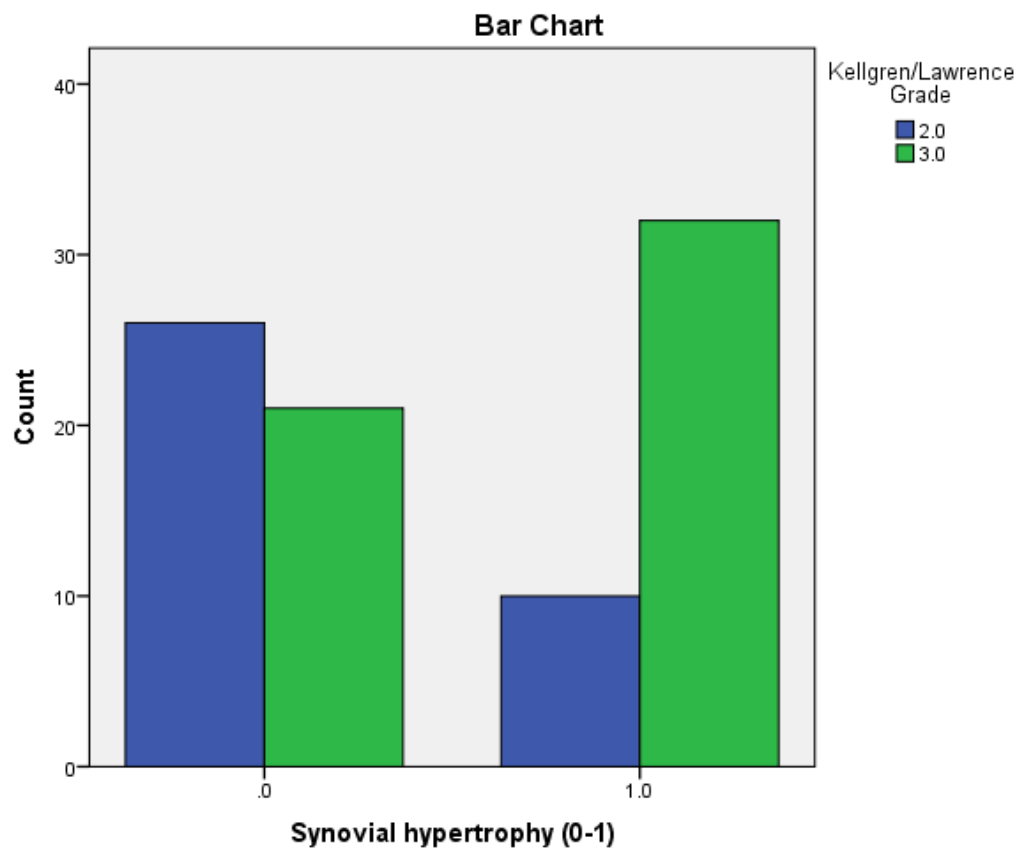
F=Femur; IPB=Infra-patella Bursitis; LME=Lateral meniscal extrusion; MME= Medial meniscal extrusion; P=Patella; T=Tibia;

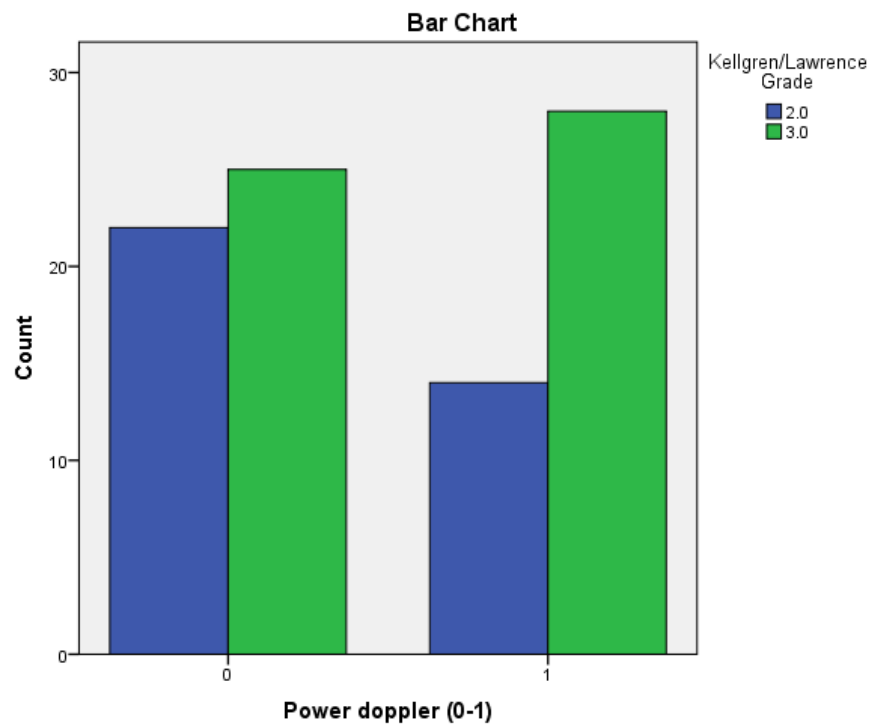
Supplementary Data 4.

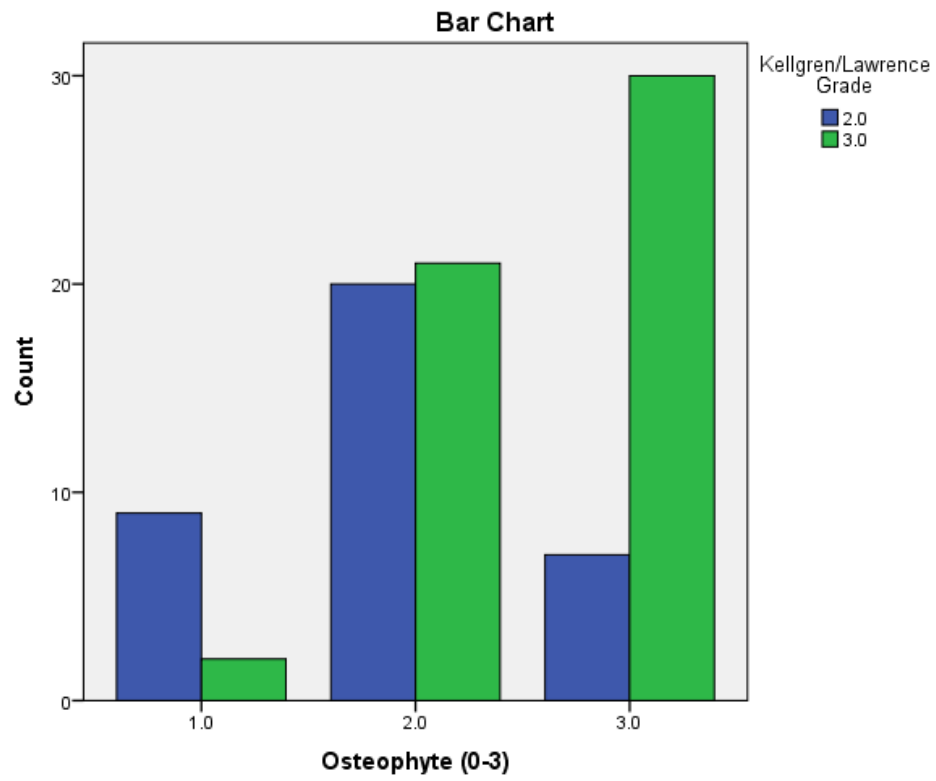
Plots of gradings of ultrasound pathologies vs radiographic KL grades

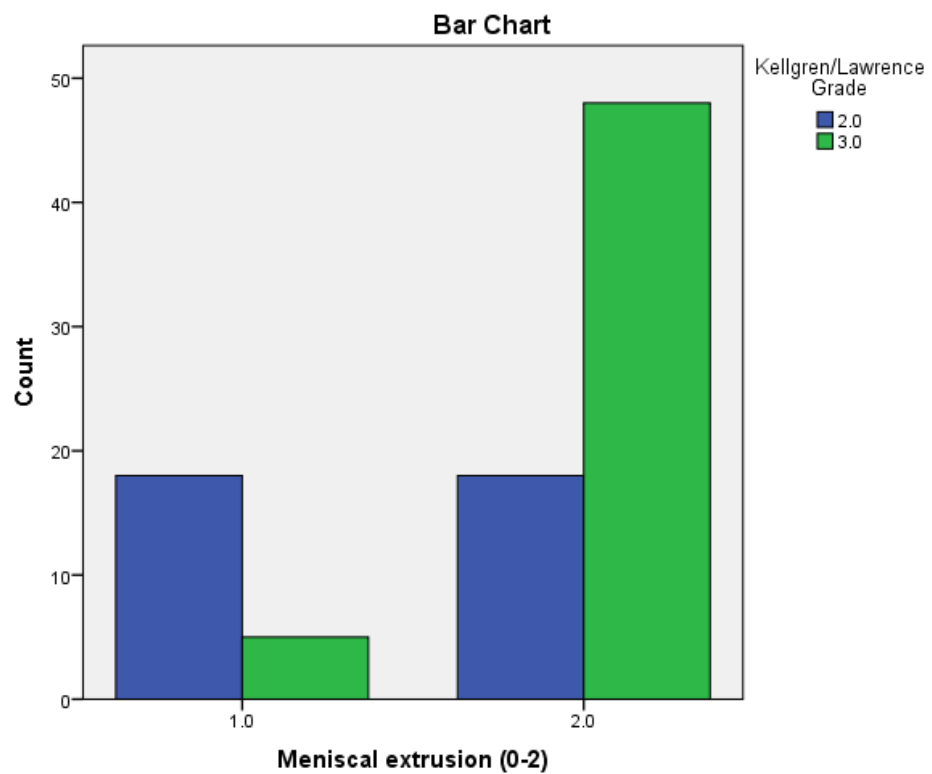


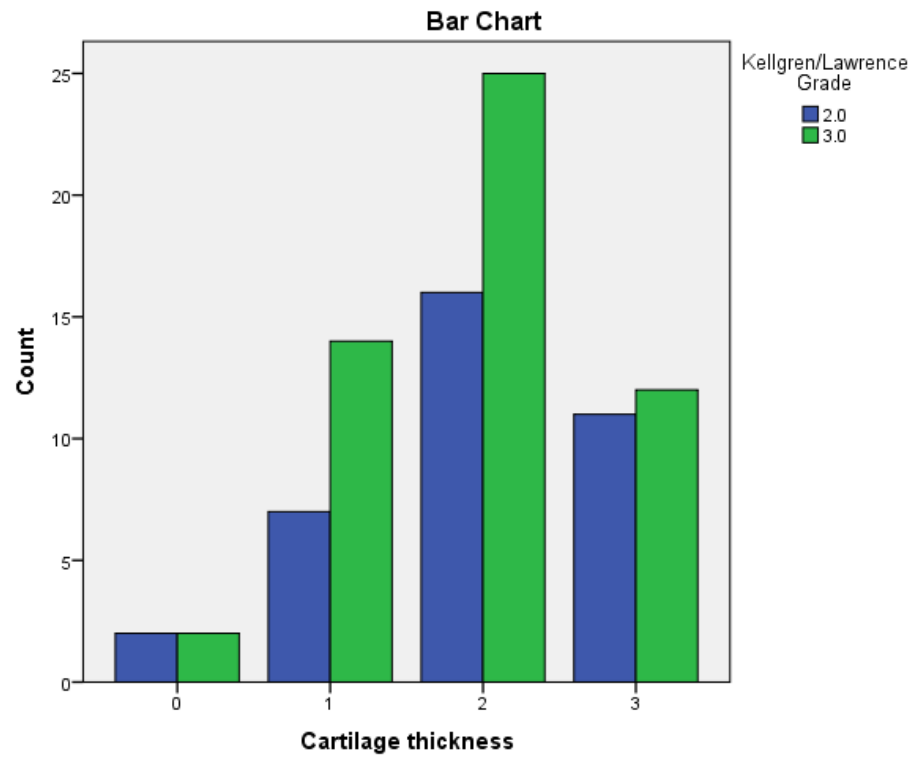












Supplementary Data 5.

Plot of grading of ultrasound pathologies vs MOAKS counterparts

