Similar incidence of extra-articular spread of contrast agent: 56.3% in US vs. 53.8% in FL group

• Similar incidence of injections that were invalid for diagnostic purposes: 6.3% in US group vs 3.8% in FL group

Studies included validation using FL / CT contrast, MRI arthrogram (or direct visualization of injectate in cadavers)

• Significant higher accuracy of US guided injections (100%) vs. LM guided (72%)

• No head-to-head comparisons of US vs. LM - all studies except one were single arm investigations

1. Martinez-Martinez 2016

RS; 32 US-guided vs. 26 FL-guided injections

Contrast spread validated using CT or MRI

• Similar incidence of extra-articular spread of contrast agent: 56.3% in US vs. 53.8% in FL group

2. Hoober 2015

S+MA; Comparing accuracy of US (4 studies, 136 injections) vs. LM (5 studies, 295 injections)

Studies included validation using FL / CT contrast, MRI arthrogram (or direct visualization of injectate in cadavers)

• Significant higher accuracy of US guided injections (100%) vs. LM guided (72%)

• No head-to-head comparisons of US vs. LM - all studies except one were single arm investigations

3. Byrd 2014

PDS; 50 consecutive patients (who had previously received FL-guided injections) received US-guided injections; another 206 patients underwent US-guided injections

• Convenience score as rated by patients (1: not convenient and 10: very convenient)

Success rate defined by:

• sub-capular space distention on US

• spread of injected contrast on FL

• Convenience score higher for US procedures (9.8) vs. FL (3.1)

• Higher accuracy in US vs. LM group (90% vs 70% respectively)

• Patients’ BMI > 30 kg m⁻²

1. Wu 2016

S+MA; 9 studies; 725 knee joints; US vs. LM

• Duration of procedure

• Procedural pain score

Success with arthrocentesis

Pain score at 2 weeks

• Similar procedure duration in two groups

• Improvement in pain score in US but not LM group at 2 weeks

• Higher success rate for arthrocentesis with US-guided injections

• Reduction in pain score with US-guidance (3 studies): US reduced pain by 2.24 more on VAS scale than the LM group

• Patients not blinded to injection guidance technique in 7 studies

2. Hashemi 2016

RCT; 100 US vs. 123 LM guided injections validated against FL

Spread of injected contrast on FL

• No difference for expert clinician for incidence of failed intra-articular injection with either technique (2/150 in US vs. 2/47 in LM)

• Higher incidence for inexpert clinician for incidence of failed intra-articular injection with LM (3/50 in US vs. 16/76 in LM)

• Injections performed by 2 groups (expert vs inexpert clinicians)

3. Bum Park 2012

RCT; 50 patients (US-guided) vs 49 patients (LM-guided)

Spread of injected contrast on FL

• Higher success rate with US (48/50; 96%) vs in LM (41/49; 83.7%)

• Patients’ BMI < 30 kg m⁻²

1. Reissiadat 2017

RCT; 20 patients (US-guided) vs 21 patients (LM-guided) received glenohumeral joint injections

Spread of injected contrast on FL

Improvement in pain, ROM, functional score at 1 and 4 weeks

• More patients were satisfied in FL/US group (30/38) vs LM group (4/12)

• More patients reported efficacy in FL/US group (32/38) vs LM group (8/12)

• No difference between US and LM group in terms of satisfaction and efficacy

• Results based exclusively on patients’ self-assessment

2. Ng 2013

RCT; 20 patients (US-guided) vs 20 patients (FL-guided) received glenohumeral joint injections

• Duration of procedure

• Number of attempted injections

Spread of injected contrast on MRI arthrogram

Procedure-associated complications

• Access to joint achieved in first attempt in all cases except 1 case in US

• Similar accuracy in both groups

• No procedural complications

• Similar duration of procedure in both groups

3. Borbas 2012

Cadaveric study; 40 US-guided injections vs. 40 LM-guided acromioclavicular joint injections

Spread of injected dye in joint on arthroscopy

Higher incidence of intra-articular joint injection in US vs. LM group (90% vs 70% respectively)

4. Patel 2012

Cadaveric study; 40 US-guided injections glenohumeral joint injections

Duration of procedure

Spread of injected contrast on FL

• Higher incidence of accurate injections in US vs. LM groups (92.5% vs 72.5% respectively)

• Longer procedure duration in US vs. LM groups (166 secs vs. 52 secs)

1. Kim 2013

RCT; 40 US-guided vs. 40 LM-guided intra-articular injection

Spread of injected contrast on imaging

Higher accuracy in US vs LM groups (100% vs. 77.5% respectively)

Patients’ BMI > 30 kg m⁻²

2. Nam 2014

RCT; 28 US-guided vs 29 LM-guided injections in distal radio-ulnar joint

Spread of injected contrast on FL

• Primary outcome: DASH score at 1, 3 and 6 months

• Secondary outcomes: VNS, MMWS, ROM at 1, 3 and 6 months

• Higher accuracy in US (100%) vs. LM (75.8%)

• Improvement in VNS, MMWS, DASH and ROM in both groups

• Improvement in VNS, DASH, ROM in “accurate” group (50: 28 in US and 22 in LM-guided groups) vs “inaccurate” group (7: all in LM-guided group) at 1, 3 and 6 months, but no significant difference in MMWS in 2 groups

1st author, year

Type of study, number of subjects

Outcomes assessed

Performance

Accuracy

Efficacy

Safety

Results and comments