Direct to MRI Identification of Scaphoid Fractures

DMIS: Service Evaluation / QIP

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Orthopaedic Audit Meeting

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Background

- Most common carpal fracture
- MRI gold standard investigation
  - Excludes injury and also allows identification of alternative diagnosis
- Direct to MRI referral pathways increasing
- **Concerns regarding demand of the ‘scanner’**
- Potential however to improve
  - Patient experience
  - Cost
  - Number of outpatient visits

Aim

To determine whether a Direct to MRI Service is:

- Safe
- Effective
- Achievable
- Desirable
- Affordable
- Needed

Objective

- Determine the **incidence** of query scaphoid fractures
- Determine effectiveness of Scaphoid scoring in VFC
- Time from injury to definitive diagnosis
  - Assess difference between DMIS and F2F
- Assess patient perception of DMIS
- Financial cost of DMIS

National Guidance

- **BSSH – Draft Guidance**
  - If a scaphoid fracture is clinically suspected on presentation but no fracture is visible on radiographs, apply a removable wrist splint, advise patients of the need for further investigation with MRI if available
  - A definitive management plan for patients with a suspected fracture should be in place within **2 weeks of presentation.** This should include MRI to exclude a scaphoid fracture unless there is a clear alternative diagnosis (eg arthritis, distal radial fracture). If referrals are managed in a virtual clinic, patients at higher risk (eg. young males with typical mechanism and signs) may be referred directly for MRI to expedite this.

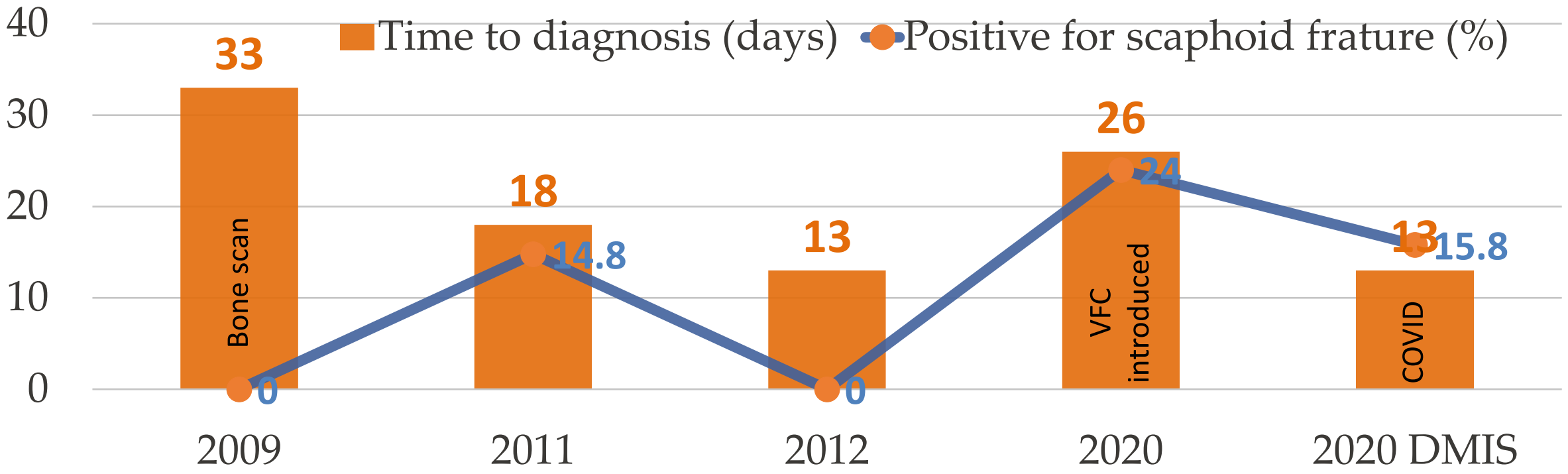
- **NICE**
  - Consider MRI for first-line imaging in people with suspected scaphoid fractures

What should we expect from Direct MR Scan?

	2020 Audit (Direct MRI) n=40	SMaRT study n=63	Bergh n=154	Jenkins n=123	Gocken n=60
scaphoid fracture incidence	15.8%	11.1%	8.4%	13%	31.6%

What's gone before?

- 4 previous audits undertaken – **last one was DMIS during COVID**



Method

- Prospective trial of VFC led Direct to MRI scanning
- 4 months
  - May - September
- Inclusion
  - Referred to VFC as a suspected scaphoid fracture with negative scaphoid radiographs

Results

- 45 patients referred over 4 month trial period
- 25F: 20M
- Average age 42 (12-62)
- 41 FOOSH / 4 ‘other’ twisting (1), fall on flexed hand (1), unknown (2)

Results – Effectiveness of score

- 31 patients triggered for DMIS (69% of cohort) [SCORE >5]
- Only 24 patient had a DMIS MRI
  - 7 patients it was not booked or patient DNA
  - Of those 7 patients
    - 3 were discharged at clinic after review
    - 3 DNA
    - One treated as suspected scaphoid in a plaster for 4 weeks then discharged

Results – Effectiveness of score

- 24 patients had DMIS
  - 11 no injury seen
  - **5 scaphoid fractures (20%)**
  - 8 other injuries
    - 1 POP 4 weeks
    - 5 futura and discharge
    - 1 UCL repair
    - 1 SL disruption declined treatment

Patients who didn’t score for DMIS

- 14 patients scored less than 5 but still referred as suspected scaphoid
  - 11 patients referred for MRI after clinic review
  - 3 discharged

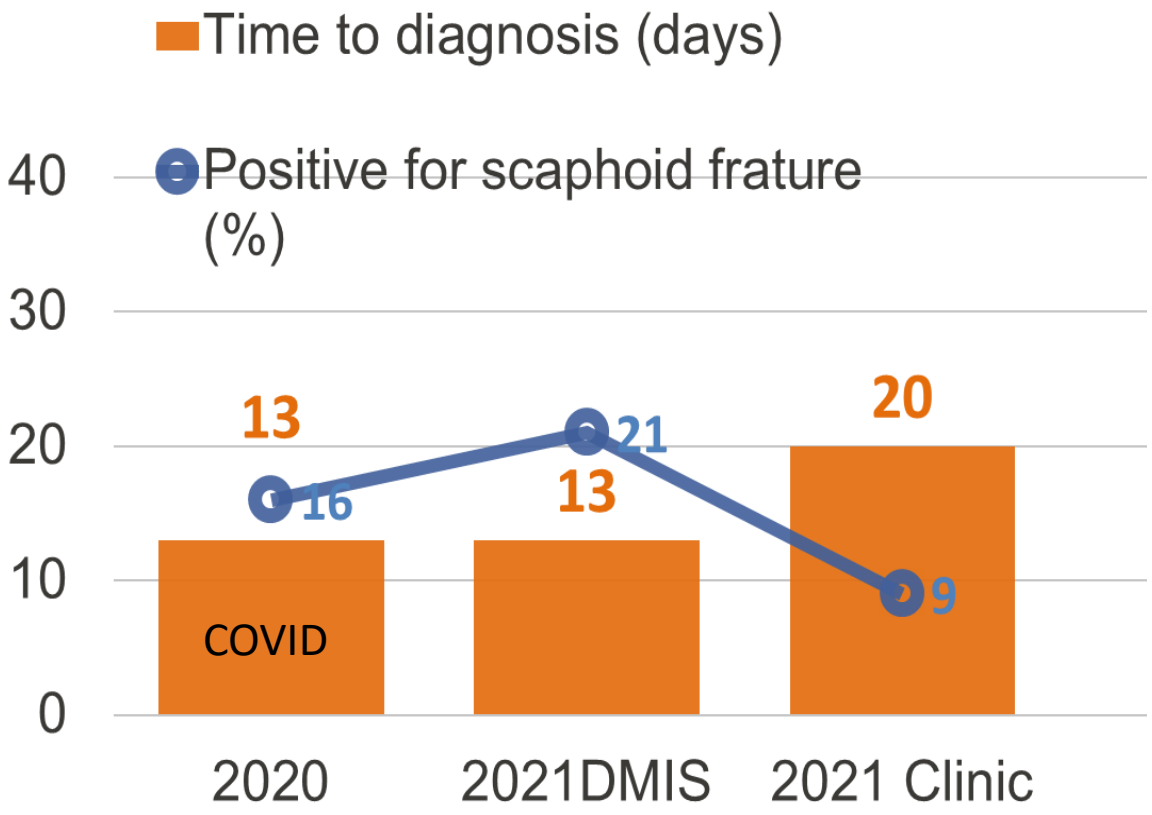
- Of these 11 had an MRI done post clinic review
  - 1 scaphoid fracture requiring POP (12 year old)
  - 1 scaphoid oedema managed in cast
  - 1 radial styloid discharged

Time to MRI / patient informed of diagnosis

- DMIS
  - ED to MRI (24 patients) **5.8 days** (2-15)
  - ED to patient informed in clinic (23 patients[one DNA]) **12.7 days** (4-37)

- Clinic assessment first
  - ED to MRI (11 patients) 10 days (3-21)
  - ED to patient informed in clinic (11 patients) **19.7 days** (8-49)

Scaphoid Incidence & Score effectiveness



	2020 DMIS	2021 TOTAL	2021 DMIS	2021 Clinic
number of MRI	39	35	24	11
Number MRI per month	**9.75**	**8.75**	6	2.75
number of scaphoid fractures	6	6	5	1
ED to MRI Scan			6	10
ED to diagnosis given to patient in clinic (mean days)	13		13	20

Financially (tariffs)

- Cost of new fracture clinic appointment is £167
- Cost of MRI scan is £240
- Majority of patients assessed in clinic referred for MRI if suspected scaphoid fracture in ED– potential saving £167 per patient

Patient perceptions

- Contacted via telephone – 13 patients (24)
- Were you happy with the treatment plan given to you over the phone by VFC? – **100% yes**
- Were you satisfied attending for an MRI scan prior to a clinic appointment? – **100% yes**
- Do you think having an MRI scan directly after attending ED decreased the time it would typically take to get a definitive diagnosis? – **92% yes**
- Would you be happy to have a scan organised prior to a clinic appointment in future if this reduced the number of times you have to attend hospital / length of time in a splint? – **100% yes**

- 80% of respondents would drive to hospital appointments – 20% public transport
- Average distance from RPH 6 miles

Can the score be simplified?

- Currently scores for
  - **ASB tenderness**
  - Longitudinal compression tenderness of thumb
  - Scaphoid tubercle tenderness
  - Pinch tenderness

- Bottom three are poorly documented – examined by non-specialists – removal of them from scoring system does not effect any patients triggering for MR scan in 2021 cohort

Conclusion

- **Safe**
  - Pathway is safely done in VFC – option to see patient F2F if unclear
- **Effective**
  - 20% of patients with DMIS score >5 have a confirmed fracture in our series
- **Achievable**
  - Incidence is unchanged – 9 scans per month
- **Desirable**
  - Patient feedback overwhelmingly positive
- **Affordable**
  - Theoretical saving per patient of £167
- **Needed**
  - Given NICE and forthcoming BSSH guidance – **yes.**

Next Steps

- Agree with radiology trust policy/guidance for VFC (Hand VFC) to MRI policy for suspected scaphoid fractures
- Simplify scoring system
- undertake training with UCC/ED (eLearning)
- Consider GLEAMER to run prospectively alongside new pathway

Thank you