Health New Zealand
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Taranaki

SPORTS ORTHOPAEDIC SURGERY CENTRE

MRI Based Femoral Component Sizing in Oxford Uni-compartmental Knee Replacements

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Disclosures

- Speaker for Arthrex, Inc
- No relevant financial disclosures

Background

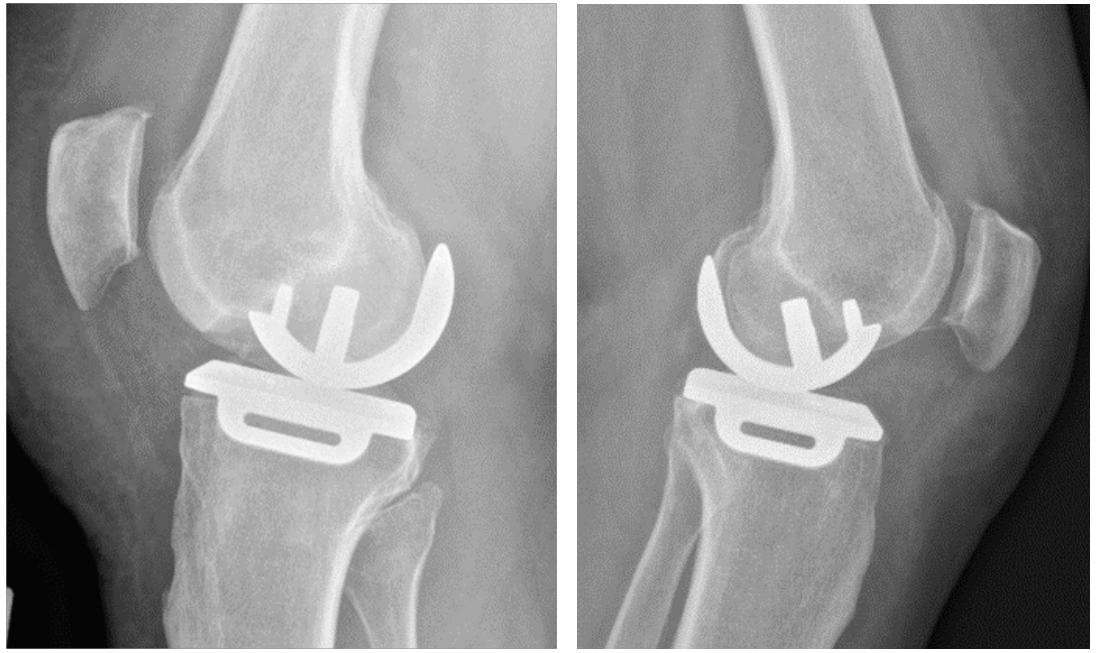
Optimising femoral component size is important

- Too big = Impingement + irritation
- Too small = Increased risk bearing dislocation
- No reproducible method so far

Novel MRI method developed

- Increased availability to MRI
- Accurate cross-sectional imaging

- Aim to assess accuracy and reproducibility



Methods

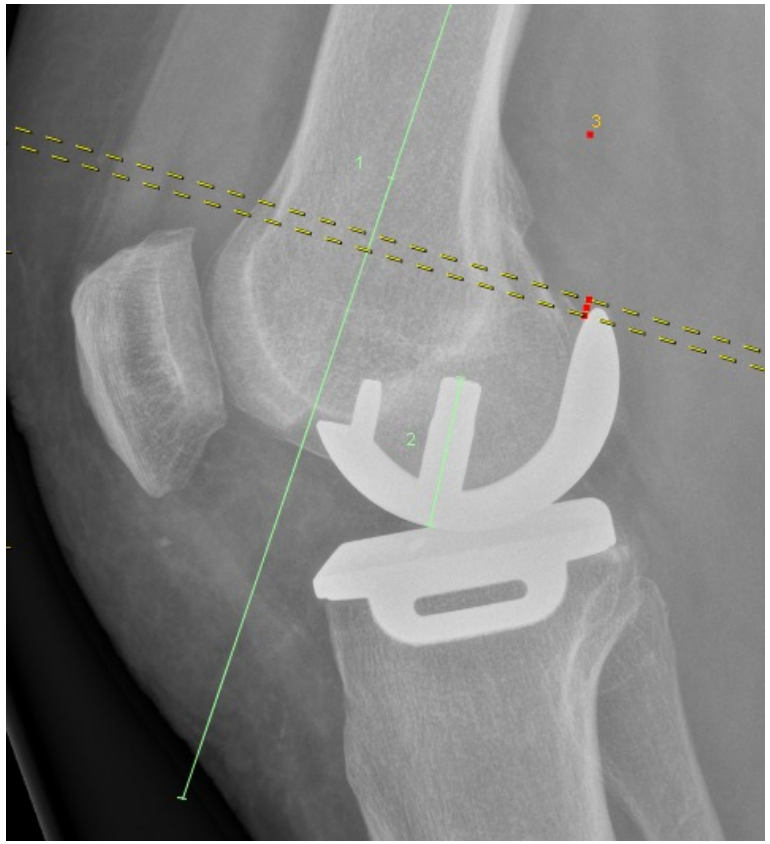
Retrospective analysis

- Single surgeon series over 6 years
- MRI sizing method adopted from January 2022

Accuracy determined by reviewing post-operative radiographs

- Femoral component overhang + component flexion
- **0-4mm** overhang considered acceptable
    - **Aim 2mm overhang**

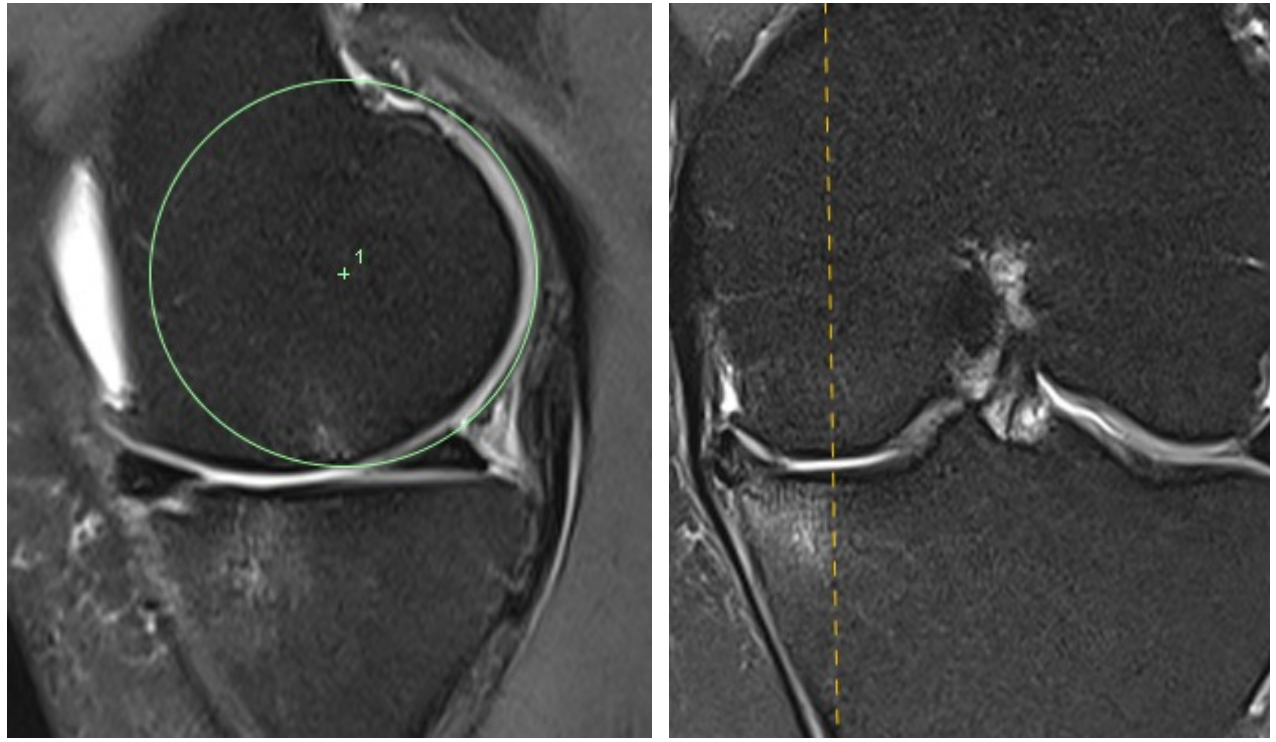
MRI sizing performed by 2 independent observers for interobserver reliability



Templating method

PD fat sat - Sagittal images

- Mid medial condyle point – reference lines to coronal
- Overlay circle corresponding to femoral component size
  - Best fit
  - Include cartilage



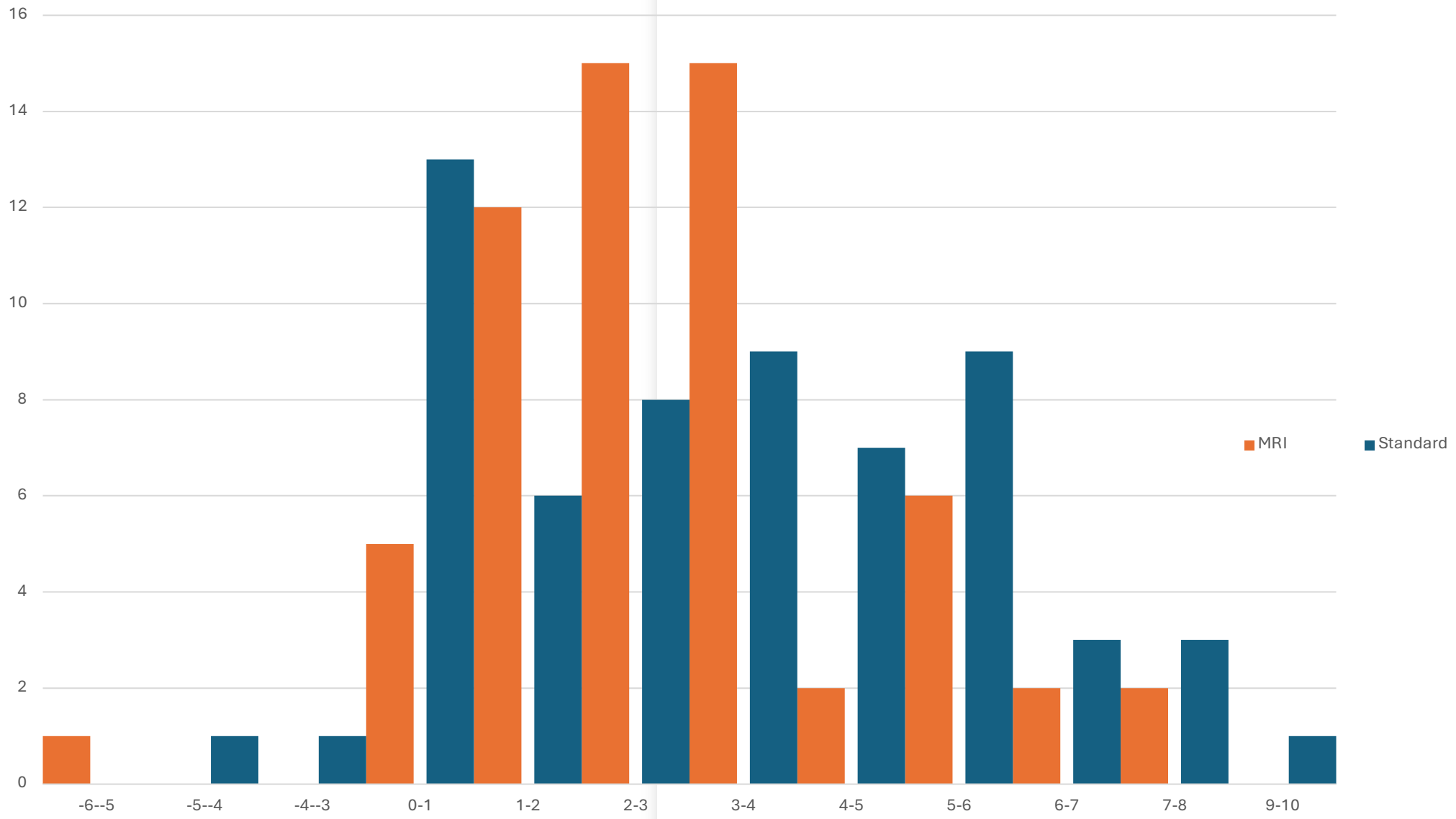
Templating Chart

Size	Radius (mm)	Area (cm2)
Extra-small	20.2	12.8
Small	22.0	15.2
Medium	23.8	17.8
Large	25.7	20.8
Extra-Large	27.5	23.8

Results

	Standard	MRI	p value
Flexion degrees	6.5	5.6	0.120
Distance to 2mm overhang	**2.30mm**	**1.67mm**	**0.03**
Outliers (<0mm or >4mm)	***25/61* = 41.0%**	***12/60* = 20.0%**	**0.007**

121 OUKR - 61 with standard sizing, 60 performed with pre-operatively MRI sizing


16
14
12
10
8
6
4
2
0
-6--5
-5--4
-4--3
0-1
1-2
2-3
3-4
4-5
5-6
6-7
7-8
9-10
MRI
Standard

Results – Inter-Observer Reliability

Agreement	Kappa	P-value	Range
75.9%	0.59	0.09	0.41 to 0.76

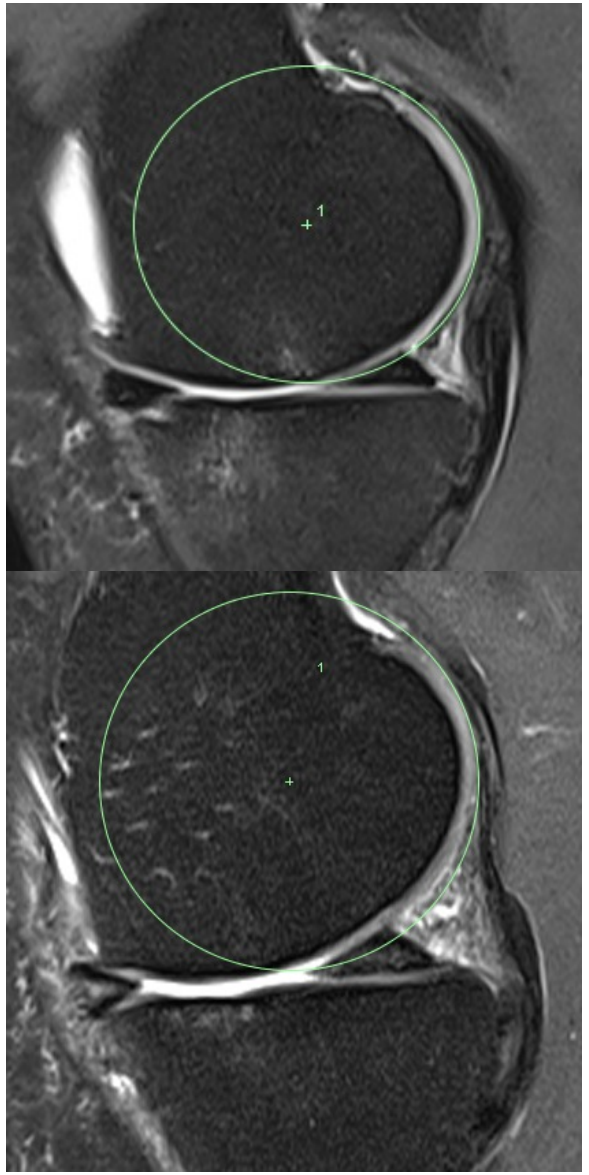
Discussion

Factors affecting MRI sizing

- Anatomic variation of femoral condyles
- Limitations of available Oxford femur sizes

Limitations

- Radiograph projection reliability
- Possible intra-operatively veto
- MRI not routine for all surgeons



Conclusion

- MRI based femoral component sizing improves accuracy and reduces outliers in partial knee replacements
- MRI sizing is quick and easy to perform
- Moderate inter-observer reliability with minimal learning curve

References

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