Central West Orthopaedics
& Sports Injuries

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CLINICALLY RELEVANT QUESTIONS

Total knee replacement is now a highly developed, effective and commonly performed procedure for advanced knee osteoarthritis. It is usually very successful in reducing pain, but patients may comment that their knee feels "mechanical" and that the joint doesn't feel "natural". The new development of guides used in the operation which are made for the individual patient based on an MRI scan offers the potential to improve comfort even further.

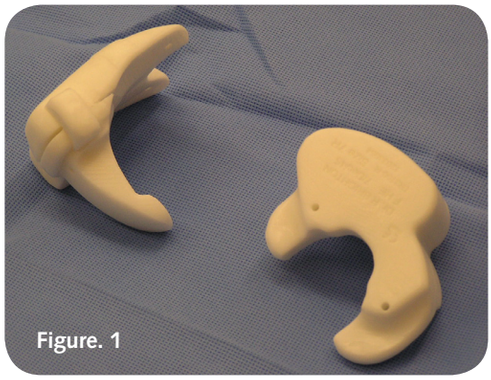
Figure. 1

This prompts the question:

Are patient specific guides the next big thing?

Results of knee replacement are already good in terms of comfort and durability. However, they are often reported to be not as comfortable as hip replacements when many recipients say of their hip, "I forget that it is there". Computer navigation was developed to improve the accuracy of insertion of knee replacement components, but that technology hasn't really translated into any improvement in longevity or comfort.[1,2,3] Also, computers in the operating theatre are fiddly to use and increase operating time.

Patient specific guides use the accuracy of computers in the laboratory during the planning phase. MRI scans generated on a computer are used to produce cutting jigs specific to that patient's anatomy (Fig. 1). The guides are placed on, and fixed to, the knee during the operation with saw cuts made through slots according to the pre-operative plan (Fig. 2 and 3). By this means it is hoped to increase the accuracy of implantation of the knee replacement and its eventual comfort.

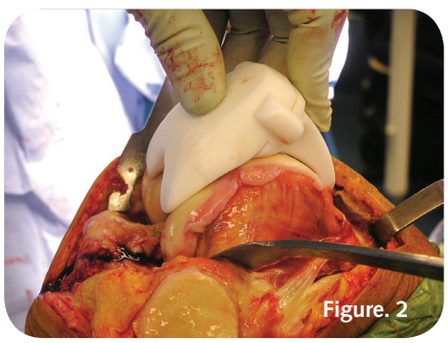
Figure. 2

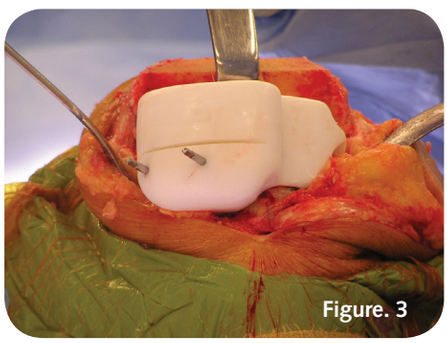
Figure. 3

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In addition, the operation becomes less invasive. Conventional cutting guides are placed on an intramedullary rod (Fig. 4) which is drilled into the middle of the femur (Fig. 5) as a fixed bony reference point. Patient specific guides avoid this step altogether and the attendant potential complications.

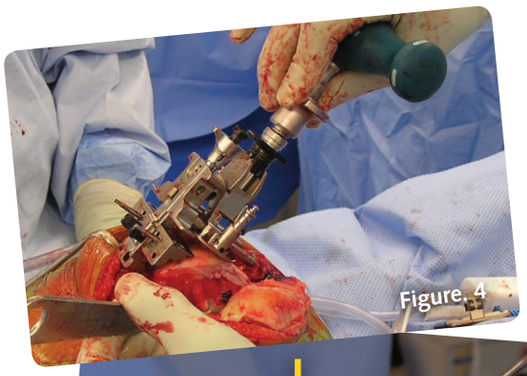
Figure. 4

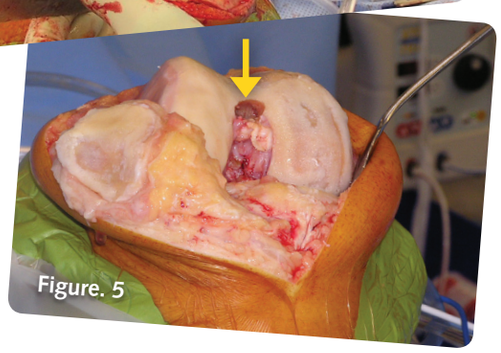
Figure. 5

There is also a saving in time (and potentially cost) in that the guides predict accurately the size and position of the components to be implanted, reducing the amount of equipment required to be sterilized and opened in the operating theatre. (Fig. 6 and 7)

This is a new approach which holds the potential to be a significant leap forward in knee surgery and the results which can be achieved. I will be carefully monitoring my own patients as this new form of operation is introduced and will be enlisting their assistance in collecting data about their functional results.


Figure. 6

VS.


Figure. 7

1. Alignment and orientation of the components in total knee replacement with and without navigation support: a prospective, randomised study
Y.-H. Kim, J.-S. Kim, S.-H. Yoon, JBJS (Br) 2007 89-B: 471-476

2. Computer navigation versus conventional total knee replacement: no difference in functional results at two years
J. M. Spencer, S. K. Chauhan, K. Sloan, A. Taylor, R. J. Beaver,
JBJS (Br) 2007 89-B: 477-480

3. The effect of post-operative mechanical axis alignment on the survival of primary total knee replacements after a follow-up of 15 years
T. J. Bonner, W. G. P. Eardley, P. Patterson, P. J. Gregg, JBJS(Br) 2011 93-B: 1217-1222

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