

ORTHO NEWSCAST



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Dear Doctor,

Greetings from Micro Labs. We are happy to bring you "Ortho Newscast" which contains latest and interesting news in the field of Orthopaedics.

This issue contains

1. Journey II, Genesis II, and Profix total knee arthroplasty short-term functional comparison
2. Individuals with femoroacetabular impingement (FAI) syndrome are more likely to have synovitis, combined femoral and acetabular version, and higher dGEMRIC scores
3. Evaluation of the effectiveness of dynamic hip screws versus gamma nails in the treatment of intertrochanteric femur fractures
4. A Case Report on Bilateral Combined Scaphoid and Distal Radial Fractures

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Looking forward to your valuable feedback

Best Regards,

Medical Team, Micro Labs Limited

Journey II, Genesis II, and Profix total knee arthroplasty short-term functional comparison

Up to 34% of individuals who undergo total knee replacement (TKR), the surgical procedure advised for treating end-stage knee osteoarthritis, experience unsatisfactory functional outcomes. The Journey II BCS (JII-BCS; Smith & Nephew), made by Smith and Nephew, is an evolutionary design that uses a bicruciate architecture to improve kinematic result when compared to the Genesis II.¹ The current kinematic design of the Journey II is thought to enhance function in comparison to the more conventional designs. The Journey II should perform no better than a regular zirconium/niobium surfaced arthroplasty, but better than a cobalt-chromium implant if the zirconium/niobium surface is the factor that affects results. With surface tribology, the goal was to compare the results of three different knee arthroplasty design philosophies.²

A medical statistician (MG) evaluated the data after identifying 313 knee replacements, including 103 Journey II, 103 Genesis II, and 107 Profix implants. For all three knee replacements, descriptive statistics for all scoring systems were compiled.

The WOMAC scores ($p = 0.140$ and $p = 0.287$), SF-12 physical ($p = 0.088$), and mental ($p = 0.975$) scores, as well as the actual or unit change in the Oxford score ($p = 0.912$ and $p = 0.874$) for the Journey II or Genesis II, did not differ amongst the three implants. In comparison to the Genesis II and Profix, the Journey II induced greater flexion and range of motion ($p < 0.001$ and $p = 0.018$, respectively), but there was no difference between the latter two ($p = 0.402$ and 0.568), and there was no difference in extension amongst the three implants ($p = 0.086$). There was no distinction between individuals who had resurfaced patellas and those who did not.

This study compared three knee replacements with various design philosophies and surface bearings, and found that there was no difference in functional outcome scores at least two years after surgery, though the Journey II significantly outperformed the other two arthroplasties in terms of post-operative flexion and range of motion. Additionally, there were no discernible changes between individuals who had the patella resurfaced and those who did not (Figure 7). With the hope of improving patient outcomes, the Journey BCS complete knee replacement was created to mimic the knee's typical kinematics.³



Genesis II CoCr total knee angled view CR.



Profix CR.



With the goal of improving patient outcomes, the Journey BCS complete knee replacement was created to mimic the knee's natural kinematics.

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2. Guta D, Santini AJ, Gornall M, Phillipson A, Davidson JS, Banks J, Pope JA, Yorke J. Short-Term functional comparison of three total knee arthroplasties-Journey II, Genesis II and Profix. *J Orthop Surg (Hong Kong)*. 2023 Jan-Apr;31(1):10225536231169572.
3. The Journey BCS total knee replacement was designed to replicate the normal kinematics of the knee with the intention that this would produce better patient outcomes.

Individuals with femoroacetabular impingement (FAI) syndrome are more likely to have synovitis, combined femoral and acetabular version, and higher dGEMRIC scores.

Femoroacetabular impingement (FAI) is a condition that causes hip pain and dysfunction with the subsequent development of primary osteoarthritis. There are three types of FAI: cam, pincer, and mixed.¹ Delayed gadolinium-enhanced MRI of cartilage (dGEMRIC) is a useful imaging technique that enables the detection of early biochemical cartilage alterations before the onset of overt structural damage. This study sought to explore, in people with symptoms, signs and imaging findings of femoroacetabular impingement (FAI syndrome): (1) whether more severe labral damage, synovitis, bone marrow lesions, or subchondral cysts assessed on magnetic resonance imaging (MRI) were associated with poorer cartilage health, and (2) whether abnormal femoral, acetabular, and/or combined femoral and acetabular versions were associated with poorer cartilage health.

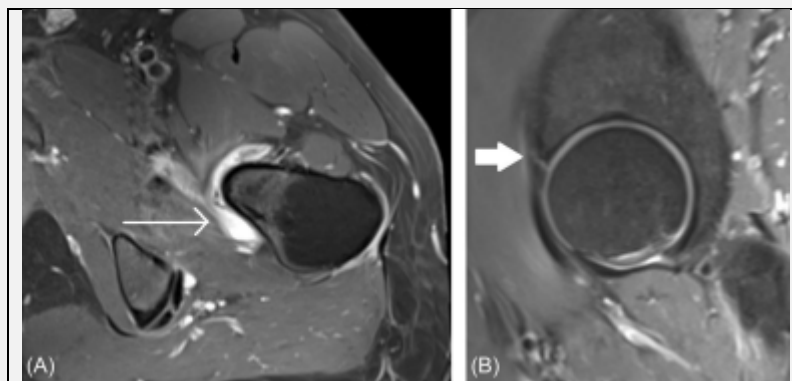
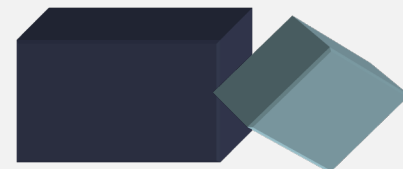


Figure 1: Hip osteoarthritis MRI score features



This cross-sectional study used baseline data from the 50 participants with FAI with available dGEMRIC scans. Cartilage health was measured using delayed gadolinium-enhanced MRI of cartilage (dGEMRIC) score sampled at the chondrolabral junction on three midsagittal slices, at one acetabular and one femoral head region of interest on each slice, and MRI features were assessed using the Hip Osteoarthritis MRI Score.

Hips with more severe synovitis had worse dGEMRIC scores (partial $\eta^2 = 0.167$, $p = 0.020$), whereas other MRI features were not associated. A lower combined femoral and acetabular version was associated with a better dGEMRIC score (partial $\eta^2 = 0.164$, $p = 0.021$), whereas isolated measures of femoral and acetabular version were not associated.

Table 1: Pairwise comparison between low, normal, and high version measurements with respect to delayed gadolinium-enhanced MRI score

	Mean difference (Ma)	95% Mg	Partial superscript(2)	n	Value
Femoral version			0.104		0.095
Low (<10 to normal (10-25%))	85.36	-15.69 to 186.40			0.124
Low (<10 to high (>25°))	18.53	-104.79 to 141.84			1,000
Normal (10-25) to high (>25°)	-66.84	-182.42 to 48.75			0.471
Acetabular version			0.109		0.083
Low (<10°) to normal (10-25%)	61.05	-83.44 to 205.33			0.895
Low (<10°) to high (>25°)	210.44	-20.09 to 440.96			0.084
Normal (10-25°) to high (>25°)	149.39	-39.27 to 338.04			0.165
Combined femoral and acetabular version			0.164		0.021
Low (<20 to normal (20-50%))	104.77	9.12 to 200.41			0.028
Low (<20°) to high (>50°)	2.90	-191.7 to 197.52			1,000
Normal (20-50 to high (>50°))	-101.87	-285.75 to 82.02			0.524

Given that impingement occurs as an interaction of the proximal femur and acetabulum in FAI syndrome, it is intuitive that combined femoral and acetabular versions would have a more easily detectable association with cartilage health than either femoral or acetabular versions considered in isolation. However, the direction of association found in this study, lower combined femoral and acetabular version being associated with better dGEMRIC score, seems counterintuitive at first glance. The lower combined femoral and acetabular version has been associated with a reduced hip internal rotation range of motion³



Hence more prone to impingement anterosuperiorly with flexion, adduction, and internal rotation. The findings in this study may relate to where we measured the dGEMRIC score.

References:

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Evaluation of the effectiveness of dynamic hip screws versus gamma nails in the treatment of intertrochanteric femur fractures

A common orthopaedic problem that frequently results in coxa vara is femoral intertrochanteric fracture, which is produced by an indirect external force. In addition to other clinical signs and symptoms, this fracture type is more frequently seen in the senior population and is characterised by localised pain and swelling.¹ A less expensive implant called the dynamic hip screw (DHS) is made to provide strong internal fixation for a variety of intertrochanteric, subtrochanteric, and basilar neck fractures. To treat trochanteric fractures, many businesses have introduced third-generation intramedullary implants. In this study, the Dynamic Hip Screw (DHS) and Gamma Nail (GN) were used to repair intertrochanteric fractures in adults. Additionally, the radiological impact of these implants on typical proximal femoral morphology was assessed.

A 40-patient, prospective, randomised trial was conducted; 20 patients underwent Dynamic Hip Screw (DHS) management, and 20 patients underwent GN management. Patients' ages ranged from 18 to 70. Patients underwent a history review, physical examination, the Harris Hip Score (HHS), and radiographic analysis.

Operative time, number of gauzes soaked in blood, number of C-arm shots, follow-up time, HHS score, postoperative complications, and changes to the proximal femur following surgery were all significantly different. Gender, age, or occupation, comorbid diseases, mechanism of injury, or side of lesion, were not significantly different.



Table 1: Comparison between the studied groups regarding presence of comorbid diseases, trauma-related data, HHS score, postoperative complications, and postoperative changes in proximal femur					
		GROUPS		Test	
Parameters		Gamma nail group	Dynamic Hip screw (DHS) group		
		N=20 (%)	N=20 (%)	x2	P
	None	8 (40)	11 (55)		
	Cardiac	2 (10)	1 (5)		
Comorbid diseases	Diabetes	(2)	3 (15)	1,283	0.903
	Hypertension	4 (20)	4 (20)		
	Diabetic hypertensive	2 (10)	(5)		
	Simple fall	11 (55)	11 (55)		
Mechanism of injury	Fall from stairs	5 (25)	6 (30)	0.234	>0.999
	RTA	4 (20)	3 (15)		
Side of lesion	Right	11 (55)	10 (50)	0.1	0.752
	Left	9 (45)	10 (50)		
	Poor	(5)	2 (10)		
HHS score	Fair	3 (15)	0 (0)	0.115	0.734
	Good	13 (65)	14 (70)		
	Excellent	3 (15)	4 (20)		
	None	16 (80)	15 (75)		
	Delayed union	1 (5)	0(0)		
Complications	Valgus deformity	1 (5)	(5)	0.448	0.503
	Varus deformity	0 (0)	(5)		
	Superficial infection	2 (10)	3 (15)		
	Non-significant	13 (65)	9 (45)		
Postoperative changes	Mild	5 (25)	9 (45)	2,135	0.144
	Significant	2 (10)	2 (10)		

There are two types of fixation: intramedullary fixation (GN, proximal femoral nail (PFN), and proximal femoral nail anti-rotating (PFNA)) and extramedullary fixation (DHS, compression hip screw (CHS), percutaneous compression plate (PCCP), Medoff sliding plate, and LISS).³ When Cheng and Sheng compared DHS and GN, they discovered that follow-up times ranged

from 3 to 19 months (the mean follow-up time was 10.06 months), and that there was a higher percentage of good scores within each group (65% and 70%, respectively, in the GN and DHS groups). Regarding HHS scores, the researchers found that there was no statistically significant difference between the studied groups. Within the nail group and the DHS group, respectively, excellent score happened in 15% and 20% of the cases. The comparison between GN and DHS revealed no notable differences as well.⁴

Although the results were slightly in favour of DHS fixation (in stable fractures), DHS and GN are effective in the treatment of trochanteric femoral fractures. GN has a shorter operating time, less blood loss, and allows for earlier weight bearing despite requiring more C-arm shots.

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A Case Report on Bilateral Combined Scaphoid and Distal Radial Fractures

A high-energy trauma is likely the cause of bilateral simultaneous fractures of the scaphoid and distal radius, which are an incredibly uncommon relationship in trauma injuries.² It is highly uncommon to have both a bilateral scaphoid fracture and a distal radius fracture. It could be ignored and come from high-energy trauma. The case study of an uncommonly coupled fracture was detailed in the current paper.²

Presentation of the case: A 22-year-old woman who had fallen while exercising and experienced excruciating pain in both wrists without any neurovascular deficit was brought into the emergency room. Scaphoid and distal radius combination fractures were visible on X-ray images on both sides. The patient had closed reduction and internal fixation with Kirschner wires, as well as 3 months of immobilisation, to treat the fractures. Within roughly 6 and 10 weeks, the fractures in the radius and scaphoid joined



Fractures of the right distal radius and scaphoid



Distal radial fractures are treated utilising a variety of techniques, such as percutaneous pinning using Kirschner wires, plates, and external fixation. The fractures in the example studied in this work were not complex, hence the researchers used the first approach. We had the option of fixing the scaphoid fractures with Herbert screws or Kirschner wires, so we went with the latter.³ This instance emphasises the value of thorough assessment for accompanying injuries after upper extremity fractures. Scaphoid fractures are commonly missed on initial plain radiographs because they are difficult to see.

Bilateral scaphoid and distal radius fractures are extremely uncommon injuries caused by high-energy trauma. The right therapy approach and an accurate diagnosis are required for this relationship.

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