Case report

Failed knee replacement: incorrect indication?

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SUMMARY

A 52-year-old woman sustained a direct soft tissue injury to the right knee following a fall onto the right knee. X-rays did not identify any bony injury. Physiotherapy decreased pain but instability persisted. MRI scans identified early degeneration. An orthopaedic opinion recommended total knee replacement. Following a total knee replacement, the pain has worsened and she remains functionally impaired 2 years following the surgical intervention. Knee replacements are commonly performed successful surgical interventions. The increased numbers of replacements might be due to the lowered threshold in recommending surgical intervention by health professionals. This may increase the failure rate. It also raises the question whether adequate non-operative measures were attempted?

BACKGROUND

Knee replacement is a common surgical intervention and the number of knee replacements is increasing year on year. In 2017, 102 117 knee replacements were performed in the England, Wales and Northern Ireland.¹ This is a 52% increase as compared with 10 years ago, when in 2007, only 67 084 knee replacements were performed.¹ Good outcomes are generally reported following total knee replacements,² however, 15% to 20% of patients remain unsatisfied following total knee replacement.³

CASE PRESENTATION

A 52-year-old woman presented to A&E in February 2016 with knee pain following a direct fall at work onto the right knee. She complained of pain in the knee with difficulty weight bearing. Examination revealed a stable knee in all planes with no swelling but a restricted range of motion. X-rays did not identify a fracture. She was referred for physiotherapy. The patient had to take time

Figure 2 Post-operative weight bearing X-rays showing implants.

off work. Physiotherapy helped to decrease pain but the patient continued to experience instability while weight bearing. A MRI scan was performed 5 months after the fall in July 2016 and it identified that the ligaments were intact but there was a stable degenerative tear of the medial meniscus. There was also early cartilage thinning on both femoral condyles and a full-thickness chondral defect on the lateral side of the trochlea. Due to ongoing pain, physiotherapy was stopped and an orthopaedic opinion was sought. The orthopaedic opinion recommended total knee replacement. Preoperative weight bearing X-rays (figure 1) were performed and 9 months following the injury, in November 2016, the patient underwent an elective right total knee replacement. The perioperative period was uneventful and patient remained in hospital only for 2 days.

OUTCOME AND FOLLOW-UP

Following surgery, the pain increased and there was restriction of movement. Postoperative X-rays (figure 2) showed good alignment of the implants. Blood tests did not identify any signs of inflammation or infection. Mobility continued to be impaired and she continued using a stick. Three years following the injury and >2 years following the surgical intervention, she continues to experience severe pain, with limitation of movement and reduced mobility. Her range of movement in the right knee is from 0 to 90 degrees. The knee is cold, with no swelling and is dry but globally tender.

DISCUSSION

Decision making to undergo any surgical intervention is a joint process between the patient and the surgeon. However, before embarking on a major procedure like a total knee replacement, the patient needs to be fully informed about the risks and benefits of surgical and non-surgical treatments. The General Medical Council provides clear

Figure 1 Pre-operative weight bearing X-rays showing no joint space narrowing.

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Table 1 The Kellgren-Lawrence classification of osteoarthritis

Grade	Description
Grade 1	Doubtful narrowing of the joint space with possible osteophyte formation.
Grade 2	Possible narrowing of the joint space with definite osteophyte formation
Grade 3	Definite narrowing of joint space, moderate osteophyte formation, some sclerosis and possible deformity of bony ends
Grade 4	Large osteophyte formation, severe narrowing of the joint space with marked sclerosis and definite deformity of bone ends.

recommendations regarding this.⁴ National Institute for Health and Care Excellence (NICE) recommends that patients with knee arthritis should be informed of non-operative measures. NICE clearly suggests some core non-surgical treatment options prior to consideration of surgical intervention. The recommendations from NICE are self-management by access to information (education), exercise, activity and weight loss.⁵ Arthritis Research UK recommends that knee replacement is a major operation and should only be considered where there are severe pain and serious mobility issues. It states that the operation works best for patients whose joint surface has worn right down to the bone (bone on bone arthritis).⁶

The Kellgren-Lawrence⁷ classification (table 1) is one of the accepted methods of grading the stage of osteoarthritis on radiographs (X-ray). Based on the Kellgren-Lawrence classification, the patient's preoperative X-ray (figure 1) shows grade 1 osteoarthritis.

Kahn *et al*⁸ reported that there is a negative correlation between the Kellgren-Lawrence scores and the postoperative outcomes. Patients who had significant arthritis preoperatively on X-rays showed better outcome scores following surgery. Patients with grade 3 and 4 Kellgren-Lawrence grades showed the best postoperative outcomes.

Non-operative treatment has shown good outcomes. Patients who might have needed a knee replacement managed to do without one following intensive non-operative measures. Skou *et al*⁹ showed that a significant number of patients with moderate and severe osteoarthritis and in whom a total knee replacement was indicated improved with non-operative management. Only 26% of the patients who satisfied the criteria to have a total knee replacement required the surgery within the 12 months of the study period. Their patients achieved an improved outcome following a 12-week non-surgical treatment programme consisting of exercises, education, dietary advice, use of insoles and pain medication.

Due to the potential lack of universal successful outcomes in knee replacements, it is important that all non-operative measures are exhausted before resorting to surgical intervention. Patients and doctors need to discuss the potential risks and benefits of surgery before reaching a well-informed decision.¹⁰

The increased numbers of knee replacements that are being performed cannot just be explained by increased demands on the healthcare system.¹¹ It is possible that a lot of inappropriate surgery is being performed. A recent study¹² analysing the appropriateness criteria for total knee replacement classified interventions as appropriate, inconclusive and inappropriate. The results revealed that up to 34% of total knee replacements were deemed inappropriate.

Contributors GA: planned the article its concept and design; collected part of the data, consent and images; provided guidance to collect research material and edited

Patient's perspective

Since having the knee replacement, my life has been completely turned upside down. The constant pain, time off work, and sleeping on the couch downstairs only begin to scratch the surface of the problems I have had since the surgery. It is the smaller things you take for granted, like not being able to enjoy the gardening or play with my grandchildren, that have impacted my life more than I was ever told it could. I am now in far worse pain after the knee replacement than I was before. I was not aware of the alternative options available to me and was informed that I needed the knee replacement. I was also not aware of the failure rate of knee replacements and that at times the outcome of the surgery could leave me worse off than before surgery. I was working at the time of my injury and understand that the X-rays and the MRI scans performed following the injury did not show any significant damage. But now following the knee replacement, I have taken a lot of time off work and am worried if I will be able to work for the next 10 years before I reach retirement age. I miss my work, playing out in the garden with my grandchildren and walking my dog.

Learning points

- Total knee replacement is a successful procedure for the right patient. Patient selection is important as there is a 20% failure rate following total knee replacements.
- Non-operative management which includes education, exercise, activity and diet as suggested by National Institute for Health and Care Excellence should be attempted before considering surgical intervention.
- Patients should be informed that if the extent of arthritis on radiographs is not severe then success from knee replacement may be limited.
- As suggested by the Academy of Royal Medical colleges,¹³ patients and care providers should provide answers to the following four questions prior to any intervention:
 - a. What are the benefits?
 - b. What are the risks?
 - c. What are the alternatives?
 - d. What if I do nothing?

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REFERENCES

- 1 NJR. NJR 15th Annual Report 2018. <http://www.njrreports.org.uk/Portals/0/PDFdownloads/NJR%2015th%20Annual%20Report%202018.pdf>
- 2 Williams DP, Blakey CM, Hadfield SG, *et al*. Long-term trends in the Oxford knee score following total knee replacement. *Bone Joint J* 2013;95-B:45–51.
- 3 Beswick AD, Wylde V, Gooberman-Hill R, *et al*. What proportion of patients report long-term pain after total hip or knee replacement for osteoarthritis? A systematic review of prospective studies in unselected patients. *BMJ Open* 2012;2:e000435.
- 4 <https://www.gmc-uk.org/ethical-guidance/learning-materials/seeking-informed-consent>

- 5 NICE. Osteoarthritis: care and management. Clinical guideline [CG177]. 2014 <https://www.nice.org.uk/guidance/cg177>
- 6 <https://www.arthritisresearchuk.org/shop/products/publications/patient-information/surgery/knee-replacement-surgery.aspx>
- 7 Kohn MD, Sassoon AA, Fernando ND. Classifications in brief: kelly-lawrence classification of osteoarthritis. *Clin Orthop Relat Res* 2016;474:1886–93.
- 8 Kahn TL, Soheili A, Schwarzkopf R. Outcomes of total knee arthroplasty in relation to preoperative patient-reported and radiographic measures: data from the osteoarthritis initiative. *Geriatr Orthop Surg Rehabil* 2013;4:117–26.
- 9 Skou ST, Roos EM, Laursen MB, *et al.* A randomized, controlled trial of total knee replacement. *N Engl J Med* 2015;373:1597–606.
- 10 Dieppe P, Lim K, Lohmander S. Who should have knee joint replacement surgery for osteoarthritis? *Int J Rheum Dis* 2011;14:175–80.
- 11 Losina E, Thornhill TS, Rome BN, *et al.* The dramatic increase in total knee replacement utilization rates in the United States cannot be fully explained by growth in population size and the obesity epidemic. *J Bone Joint Surg Am* 2012;94:201–7.
- 12 Riddle DL, Jiranek WA, Hayes CW. Use of a validated algorithm to judge the appropriateness of total knee arthroplasty in the United States: a multicenter longitudinal cohort study. *Arthritis Rheumatol* 2014;66:2134–43.
- 13 <https://www.choosingwisely.co.uk/about-choosing-wisely-uk/>

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