



■ ANNOTATION

What is the most effective treatment for basal osteoarthritis of the thumb?

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Basal osteoarthritis of the thumb is extremely common and causes pain and difficulty with essential 'pinching' tasks such as writing and dressing. It has been shown, in high-quality studies, that physiotherapy can result in clinically important improvements in pain and function, but the delivery of nonoperative treatment currently varies considerably throughout the NHS in the UK. Trapeziectomy is an effective, simple, and low-cost procedure, and the most common of surgical treatment for basal osteoarthritis of the thumb in the UK. However, recovery can be lengthy and complications include subsidence of the thumb metacarpal, instability, and weakness. New designs of thumb carpometacarpal joint arthroplasty (CMCJA) show promising early results with low complication rates and a quick return to function, but the implants are expensive and high-quality evidence about the outcome is lacking. The Surgery versus Conservative Osteoarthritis of Thumb Trial (SCOTT) is a multicentre, three-arm, randomized controlled trial which is currently being undertaken, comparing the clinical outcomes and cost-effectiveness of an enhanced package of non-surgical management, trapeziectomy, and thumb CMCJA.

Cite this article: *Bone Joint J* 2026;108-B(1):4–8.

Introduction

Basal osteoarthritis (OA) of the thumb is very common, with a worldwide prevalence radiologically of 5.8% and 7.3% in 50-year-old males and females, respectively, rising to 33.1% and 39% in 80-year-old males and females.¹ Only a relatively small proportion of people with radiological evidence of basal OA of the thumb have substantial symptoms, but with such a high prevalence and an ageing population this is reflected in an increasing number of patients seeking treatment. Symptomatic basal OA of the thumb is estimated to occur in 11% of males and 20% of females aged > 50 years in England,² and this prevalence increases with advancing age.¹ The carpometacarpal joint (CMCJ) of the thumb is a biconcave saddle joint which enables a wide range of motion. Reaction forces in this joint are 12 times higher than the pinch force. These forces and the shape of the joint have been thought to predispose to OA.^{3,4} Basal OA of the thumb causes considerable morbidity with symptoms which include pain, tenderness, and stiffness. These patients have difficulty with essential 'pinching' tasks such as writing, dressing, and opening packets, because the greatest load is taken through the CMCJ during these activities (Figure 1).⁵

The National Institute for Health and Care Excellence (NICE) guidelines, from 2014, advocated a stepwise approach to the treatment of basal OA of the thumb starting with non-surgical treatment progressing to surgery.⁶ Non-surgical treatment can involve analgesic and/or anti-inflammatory medication, education, exercise, splints, and steroid injections. Although it has been shown that these treatments can be delivered in a consistent, evidence-based, effective package,⁷ the current delivery of treatment varies considerably throughout the NHS in the UK. Most patients have not been treated with all non-surgical options before being offered surgery, with only 32% having received hand therapy, splints, and injections.⁸ A systematic review of randomized controlled trials (RCTs) of non-surgical treatments previously concluded that high-quality evidence showed that physiotherapy can result in clinically important improvements in pain and function.⁹ These improvements have been shown to be sustained for at least five years, with surgery only being required in 22% of patients at a median of seven years follow-up.¹⁰

Trapeziectomy is a simple, predictable, and effective surgical procedure, with a long-term revision rate of < 5%, most commonly soft-tissue

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© 2026 The British Editorial Society of Bone & Joint Surgery
doi:10.1302/0301-620X.108B1.
BJJ-2025-0483.R1 \$2.00

Bone Joint J
2026;108-B(1):4–8.



Fig. 1

Anteroposterior radiograph of a 68-year-old female patient showing severe osteoarthritis of the carpometacarpal joint of the thumb with adduction of the first metacarpal and compensatory hyperextension of the metacarpophalangeal joint.

interposition or stabilizing procedures for persistent pain.¹¹⁻¹³ It has been shown in previous RCTs that it improves function and quality of life, and is routinely used in clinical practice in the UK.^{14,15} Long-term improvements in pain and function are seen in 85% of patients. However, recovery after trapeziectomy is lengthy and can take at least nine months.¹⁶ Only 75% of patients who undergo trapeziectomy would have the procedure



Fig. 2

Intraoperative anteroposterior radiograph of a TOUCH (KeriMedical, Switzerland) dual mobility carpometacarpal joint arthroplasty of the thumb in a 58-year-old male patient.

again.¹⁷ Complications include subsidence of the thumb metacarpal into the space previously occupied by the trapezium and impinging against the scaphoid or trapezoid, instability, and weakness. Some surgeons perform soft-tissue procedures with the aim of preventing impingement using tendons to suspend the metacarpal or as interposition material. However, there is no evidence that these techniques improve the outcome, and they can cause complications such as tendonitis.^{15,18}

CMCJ arthroplasty (CMCJA) of the thumb is increasingly being carried out in the UK. Sales of the TOUCH CMCJA prosthesis (KeriMedical, Switzerland) doubled in the UK in 2024, with > 1,000 implants being used.¹⁹ At least 29 hospitals in the UK now routinely offer CMCJA for CMCJ OA of the thumb, and this continues to increase. The early designs of CMCJAs showed variable outcomes with some good long-term results, but a high rate of dislocation and failure was reported in some studies.²⁰ Newer implants have been introduced with mid- to long-term studies showing low complication rates and excellent functional outcome, improved pinch strength, and good patient satisfaction.²¹⁻²³ Ten-year implant survivals of 93% and 95% have been reported by Martin-Ferrero et al²⁴

and Tchurukdichian et al,²⁵ respectively. These studies reported results in 216 CMCJAs in 199 patients and 110 CMCJAs in 95 patients, respectively. Comparative studies and a small RCT comparing CMCJA with trapeziectomy have in the past shown faster recovery of function with CMCJA.^{26–28} Patients also preferred the appearance of their thumb after CMCJA compared with trapeziectomy.²⁷

The newest designs of CMCJA are dual mobility with two articulating surfaces in the prosthetic cup, intended to reduce the dislocation rate (Figure 2). Small early case series suggest promising results.^{21–23} However, these implants are not yet required to be registered on the National Joint Registry in the UK, and there is therefore no formal repository of outcomes. A recent systematic review and meta-analysis suggested that CMCJA may provide quicker improvement in function and better mid- to long-term function and strength than trapeziectomy, with similar reduction in pain.²⁹ However, CMCJA was associated with a significantly higher complication rate (odds ratio (OR) 2.12 (95% CI 1.13 to 3.96); $p = 0.02$) and higher revision rate (OR 5.14 (95% CI 2.06 to 12.81); $p = 0.0004$). Most studies included older, single mobility designs. The 14 papers reviewed were graded as of very low to moderate-quality evidence and included only one small RCT. Consequently, there is a need for high-quality evidence comparing the clinical and cost-effectiveness of modern CMCJAs and trapeziectomy.

Basal OA of the thumb has been highlighted as a research priority by the Royal College of Surgeons and the James Lind Alliance Partnership for Common Conditions of the Hand and Wrist with the British Society for Surgery of the Hand.³⁰ The UK National Institute for Health and Care Research recently funded a RCT to determine the clinical and cost-effectiveness of treating this condition, with or without surgery, and to determine the clinical and cost-effectiveness of trapeziectomy compared with CMCJA.³¹ The Surgery versus Conservative Osteoarthritis of Thumb Trial (SCOOTT) is a multicentre, superiority and non-inferiority three-arm RCT with an internal pilot, economic evaluation, and nested qualitative study. A total of 656 patients will be randomized on a 3:3:2 basis to undergo trapeziectomy, CMCJA, or an enhanced package of non-surgical management (Enhanced Non-surgical manAGEMENT (ENGAGE)).

For patients undergoing trapeziectomy or CMCJA, in order to justify the risk of complications and higher healthcare costs, surgery must be superior to non-surgical treatment in terms of patient-reported pain relief and function. Therefore, the study is powered on the basis of superiority between surgical and non-surgical treatment. Given the potential benefits of CMCJA over trapeziectomy, a direct comparison of the two procedures is required to establish whether the clinical outcomes and cost-effectiveness of CMCJA are not worse than those of trapeziectomy. Therefore, the study is powered to detect non-inferiority between the two surgical arms.

Adults with symptomatic basal OA of the thumb whom the treating clinician considers may benefit from surgery will be eligible. Patients will be excluded if they have had previous surgery to the symptomatic thumb, inflammatory arthritis, infection, comorbidities precluding surgery, if they are unsuitable for either operation (such as having a trapezium whose height is

< 8 mm, which is inadequate to hold the cup component of a CMCJA), or if they would be unable to adhere to the procedures of the trial, such as those with cognitive impairment.³²

Trapeziectomy will be performed according to the treating surgeon's preferred technique, with or without ligamentous reconstruction. Previous RCTs have compared several techniques for trapeziectomy and ligamentous reconstructions, and have not demonstrated superiority of one over another.^{33,34} CMCJA will be performed again according to the treating surgeon's preferred technique and implant. The postoperative rehabilitation for both procedures will be determined by the usual practice of the treating surgeon and physiotherapists.

ENGAGE is a programme of personalized, psychologically informed conservative treatments, supported by evidence-based online and paper educational material, which will be delivered by hand therapists. The elements of the programme include hand exercises, education about the condition and its management, and personalized task modification. Thumb splints may be prescribed and steroid injections given as part of this programme. It will also involve pain coping strategies which have not previously been used specifically in the management of basal OA of the thumb, but are an important component of the successful ESCAPE-pain programmes for the treatment of OA of the hip and knee.^{35,36} The study is designed to be comprehensive and deliverable, with 17 NHS sites having delivered a similar programme in a recent multicentre trial.⁷ Where there is variation, standardizing the non-surgical care pathway has been shown to be effective.^{37,38}

The Australian Canadian (AUSCAN) hand pain index score at one year after randomization will be the primary outcome measure.³⁹ This is a patient-reported, disease- and hand-specific questionnaire, with a total score ranging from 0 to 20, higher scores indicating more pain. It is reliable and responsive to change in patients with OA of the hand, and has established construct validity as an instrument for use in those with basal OA of the thumb.⁴⁰

The secondary outcome measures for this study include the Patient Evaluation Measure score,⁴¹ the EuroQol five-dimension five-level general health-related quality of life questionnaire,⁴² grip strength, range of motion of the thumb, complications of treatment, and the use of health and social care resources. Following randomization, all patients will be followed up for 18 months. They will be reviewed on the day of their surgery or therapy, and again at six weeks and three and six months after treatment, and six, 12, and 18 months after randomization. Follow-up after treatment and randomization was chosen to account for differences in waiting times between sites and intervention groups while providing meaningful clinical results within a feasible timescale. Recruitment started in December 2024 and the results will be reported in 2028.



Take home message

- The Surgery versus Conservative Osteoarthritis of Thumb Trial (SCOOTT) is a three-arm, randomized controlled trial designed to determine the clinical and cost-effectiveness of treating arthritis of the base of the thumb, with or without surgery, and to determine the clinical and cost-effectiveness of trapeziectomy compared with thumb carpometacarpal joint arthroplasty.
- The trial results will be reported in 2028.

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Funding statement:

The authors disclose receipt of the following financial or material support for the research, authorship, and/or publication of this article: the SCOOTT trial was funded by the National Institute for Health Research Health Technology Programme (Award ID: NIHR154694).

ICMJE COI statement:

All authors report funding for the SCOOTT trial by the National Institute for Health Research Health Technology Programme (Award ID: NIHR154694), related to this study. E. Reay reports a role as Surgical Specialty Lead for the Royal College of Surgeons (RCS) and the British Society for Surgery of the Hand (BSSH), not related to this study. The lead author affirms that this manuscript is an honest, accurate and transparent account of the study being reported, that no important aspects of the study have been omitted, and that any discrepancies from the study as planned have been explained.

Data sharing:

The data that support the findings for this study are available to other researchers from the corresponding author upon reasonable request.

This article was primary edited by J. Scott.