Nail or plate for trochanteric hip fractures?

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Orthopaedic surgeons may be forgiven for being confused over the current advice on the preferred implant for trochanteric hip fractures; this is an area where there is ongoing research along with continual changes in implant design and surgical technique. In addition to the numerous case series reports, to date, 78 different randomized controlled trials (RCTs) involving 12,642 participants have compared nail versus plate fixation.[1,2] National guidelines on this topic give conflicting advice, with the USA recommending an intramedullary nail for most extracapsular hip fractures,[3] the National Institute for Health and Care Excellence (NICE) guidance from the UK recommending the sliding hip screw (SHS),[4] and others recommending either method of treatment.[5,6]

Prior to 2000, there were clear advantages for the SHS with an increased risk of complications of surgical fixation for the nail. This was related primarily to implant breakage and fracture around the tip of the nail. With changes to the nail design, these differences have been reduced and there is a trend now, albeit not statistically significant, to fewer fixation failures with the nails.[1]

A notable finding that has emerged from a number of the RCTs is an improved recovery of mobility and a reduced dependence on walking aids for those treated with the nail fixation.[1,2,7-12] The improvement is present for all fractures types (stable and unstable),[13] and is more significant for those of good mobility prior to the injury. For those of limited mobility, those living in institutional care, or those with signifiant mental impairment prior to the fall, the differences are probably inconsequential.[11,14] This improved recovery of mobility may be either due to the reduced tissue damage at surgery or, more likely, the presence of the proximal part of the nail within the femur limiting collapse occurring at the fracture site, enabling the fracture to heal in a closer to anatomical position.[15]

A further proven benefit for the nails is the reduced risk of both superficial and deep wound infections. Summation of data from the RCTs gives figures for superficial infections of 73/2,853 (2.6%) versus 107/2,967 (3.6%) (risk ratio (RR) 0.71, 95% CI 0.53 to 0.95; p = 0.026) and for deep sepsis of 17/3,653 (0.47%) versus 30/3,654 (0.82%) (RR 0.57, 95% CI 0.31 to 1.03; p = 0.08).[1] Other potential benefits that have been reported for nail fixation in some of the randomized studies are an improved Harris Hip Score,[16] reduced operating blood loss, reduced blood transfusion, reduced operating times, and reduced nonunion rates. No difference in other outcomes for mortality, health-related quality of life measures, residual pain, hospital stay, and general medical complications have been identified.[1]

Concerns have been expressed about a possible increase in mortality for nail fixation.[17] This risk does not apply for short nails used for trochanteric fractures, as the summation of the randomized trials clearly indicates no difference in mortality at any timepoints (one-year mortality nails 753/3,784 (19.9%) for nails vs 782/3,834 (20.4%) for plates (RR 0.99, 95% CI 0.90 to 1.08)).[1] It is possible that any differences in mortality between nails and plates may be an issue for more complex fracture types and longer nail lengths, for which further studies are warranted.

Implant costs should also be considered as they tend to be higher for the nails. Implant prices do, however, vary substantially both nationally and locally. For the short nails used for trochanteric fractures, the differences in price between a nail and the SHS vary from being equivalent to being three to four times more for the nail. Local pricing structures will therefore dictate any cost-benefit analysis.

In summary, both the SHS and intramedullary nails are excellent and acceptable treatment methods for trochanteric fracture. In recent years, the developments in extramedullary fixation have failed to achieve any notable improvements in outcome,[18] while the continued development for the nails has lead to a significant improvement, particularly in relation to the improved regain of mobility. There are still areas for research and development of the nails, including the optimum nail length, diameter, uni- versus biaxial fixation, reaming versus unreamed, and the need for distal locking. The continued increase in the use of the nails is to be expected, and we should anticipate further improvements will occur that will continue to improve the outcome for this large group of patients.

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