



Treatment options of arm fractures in the elderly

A systematic review and assessment of the medical, economic, social and ethical aspects

SBU ASSESSMENTS | ASSESSMENT OF METHODS IN HEALTH CARE AND SOCIAL SERVICES

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Executive summary

SBU, The Swedish Agency for Health Technology Assessment and Assessment of Social Services, has evaluated the effects, complications, health economic aspects and ethical considerations of arm fractures treatment in the elderly with a mean age above 60 years. The project originates from a proposal from the Swedish Orthopaedic Association. The systematic review also includes studies on how patients with osteoporosis experience participation in their care and their encounters with health care professionals.

Conclusions

- ▶ Using plaster casts to non-surgically immobilise less complex wrist (distal radius) fractures appears to result in the same functional outcome as surgical techniques, involving open reduction and internal fixation (ORIF) of a metal plate to the bone (plate fixation) or fixing external supports to the bone through small incisions in the skin (external fixation or pinning), at one year follow-up. Treatment with plaster casting appears to result in grip strength equivalent to that achieved with external fixation/pinning methods. Quality of life outcomes appear to be as good or better with external fixation/pinning. It is increasingly common for patients with wrist fractures to be surgically treated, at a higher treatment cost.
- ▶ Treating less complex wrist (distal radius) fractures with surgery using either plate fixation or external fixation methods appears to result in equivalent function, grip strength and quality of life, at one year follow-up. Plate fixation has become more common, even though more patients treated this way require reoperation and this treatment method costs more than external fixation or pinning.
- ▶ Using a sling to support the arm of patients with less complex shoulder (proximal humerus) fractures appears to result in the same levels of function and quality of life as the surgical treatment ORIF, at one year follow-up. Non-surgical treatment results in the same functional outcome as a partial shoulder replacement (hemiarthroplasty) at one year follow-up. However, the trend in Sweden is that patients with shoulder fractures are being treated surgically more often, at a higher treatment cost.
- ▶ Surgical treatment of less complex fractures of the wrist and shoulder may lead to unnecessary surgery. This could lead to less resources being available for other health care interventions.
- ▶ In their encounters with the health care system, patients with osteoporosis perceive that they often receive insufficient, incorrect or contradictory information, which complicates their health care decision making process. Patients with osteoporosis perceive that they are often left to themselves with insufficient information on how to manage their health. They want to be taken seriously as individuals.
- ▶ Several evidence gaps were identified. More randomised controlled studies comparing common treatment methods for arm fractures in the elderly are needed. The studies must have sufficient power, accurately describe the severity of the fractures, use validated instruments to measure outcomes and follow patients up for at least one year. Aspects of health economics also need to be highlighted in future studies. Studies that describe how elderly patients who specifically had arm fractures perceive their health care experience are needed. Future studies should also report the results from the perspective of both men and women.

Background

The treatment of patients with arm fractures varies throughout Sweden. Approximately 12 000 women and 2500 men fracture their wrists each year in Sweden. Shoulder fractures are reported for more than 6000 women and almost 2000 men yearly.

Objective

The objective of this systematic review was to assess the available scientific evidence regarding the effects and complications of different treatment options for arm fractures in the elderly from medical, economic, ethical and social perspectives. The review also explores how patients with osteoporosis experience their participation in their care and their encounters with health care professionals. A practice survey was also conducted to examine treatments used in Sweden from 2005 to 2013, and to identify what proportion of fractures were treated surgically.

Method

A systematic review was undertaken following the PRISMA statement and standard methods used by SBU. A literature search covering the period January 1990 to December 2016 was conducted in international databases (PubMed, Embase, Scopus database, and the Cochrane Library). To be included in this review, the studies had to be published in a peer reviewed journal in English, Swedish, Norwegian, or Danish. The studies must have investigated the benefits and possible risks of different methods for treating arm fractures in elderly patients (the mean age of the study population needed to be at least 60 years). The assessment included randomised controlled studies (RCTs), non-randomised controlled studies and registry studies with at least 15 patients per treatment group. To be included, the studies had to report one of the following outcomes with at least one year of follow-up: function, grip strength, quality of life, complications, social costs or cost-effectiveness.

The Swedish Osteoporosis Association (Osteoporosförbundet) was consulted to provide information about the perspectives of patients and relatives. As a result, qualitative studies that addressed the involvement or experiences of patients with osteoporosis in their encounters with the health care system were included.

Studies that fulfilled the inclusion criteria were assessed for relevance and quality by two experts independently, using pre-set protocols. Disagreements were collectively assessed by all six participating experts. The strength of the scientific evidence was assessed with the Grading of Recommendations

Assessment, Development and Evaluation (GRADE) system. The Confidence in the Evidence from Reviews of Qualitative research (CERQual) was used to assess the evidence of qualitative findings.

Results

Quantitative evidence – Effects and complications of different treatment options for arm fractures in the elderly

Of the 9815 articles identified in the literature search, 49 RCTs and 31 non-randomised controlled or register studies met the inclusion criteria for this report and were classified as having moderate or high quality. A total of 23 treatment comparisons were included. Based on patient records from the Swedish National Patient Register, administered by The National Board of Health and Welfare, the number of men and women with wrist or shoulder fractures treated with surgical methods has increased between 2005 and 2013. Plate fixation was the most frequently performed surgical fixation method.

This systematic review shows that there is scientific evidence indicating that there is no clear benefit to choosing surgical fixation methods over the less costly non-surgical treatment options for elderly with simple or less complex arm fractures.

Distal radius fractures

No clinically significant difference in functional outcome as measured by DASH (Disabilities of the Arm, Shoulder, and Hand score; mean difference (MD) -3.29 (95% CI, -7.03 to 0.44)) could be detected between treating simple and less complex fractures of the wrist with locking plates compared to non-surgical treatment with a plaster cast at one year follow-up. The intervention cost is at least EUR 1300 higher for treatment with locking plates than for non-surgical treatment, excluding the costs for complications. No clinically significant difference in function or grip strength was seen between external fixation/pinning and plaster casting at one year of follow-up. Non-surgical treatment resulted in significantly fewer complications. The cost for external fixation/pinning is at least EUR 900–1000 higher when compared to plaster cast, excluding any costs for complications.

No clinically significant difference in function, grip strength, quality of life or minor complications was seen between plate fixation and external fixation/pinning at one year of follow-up. Treatment with volar locking plates had significantly more major complications requiring additional surgical intervention and

it costs at least EUR 300–400 more than external fixation/pinning, excluding costs for complications.

Proximal humerus fractures

No clinically significant difference in functional outcome as measured by DASH or Constant scores at one year follow-up (standardised mean difference (SMD) -0.17 (95% CI, -0.56 to 0.23)) was detected between partial shoulder replacements (HA) and the non-surgical treatment of supporting the arm in a sling for patients with simple or less complex fractures of the shoulder. The intervention cost for HA is at least EUR 5000 higher than non-surgical treatment, excluding any costs for complications. Treatment with plate fixation compared to non-surgical treatment did not show any clinically relevant difference in functional outcomes (SMD -0.05 (95% CI, -0.26 to 0.15)), quality of life (MD -0.01 (95% CI, -0.06 to 0.05)) or in the frequency of major complication (Risk difference (RD) 0.07 (95% CI, -0.06 to 0.20)). The cost of plate fixation is at least EUR 3500 higher compared to a non-surgical treatment, excluding costs for complications.

A statistically significant difference was identified between reverse shoulder arthroplasty (RSA) and HA for functional outcome in patients with complex shoulder fractures, although these findings may not be clinically meaningful. The cost of RSA is at least EUR 1950 higher than for HA, excluding costs for complications.

Qualitative evidence – The experiences and involvement of patients with osteoporosis in their encounters with health care professionals

Of the 375 qualitative research articles identified in our systematic search, only 9 articles met our inclusion and quality criteria. The results of SBU's assessment of the qualitative research evidence indicate that patients with osteoporosis perceive that they often receive insufficient, incorrect and contradictory information in their meetings with health care, which makes it difficult for them to make informed decisions about their health care. They expressed a desire to be taken seriously, and wish to be seen as individuals with needs that extend beyond their medical condition. These results suggest that a discussion in health care is warranted to address empathy and the way health care professionals meet patients with osteoporosis.

Evidence gaps

There is insufficient relevant scientific evidence to draw reliable conclusions about the efficacy of many of the methods used for treating arm fractures in the

elderly. For some methods, no evidence was found, while the available evidence was not sufficiently methodologically robust for other methods. For some methods, there were too few studies to be able to draw any reliable conclusions (e.g. quality of life outcomes for the comparison between surgical techniques for treating shoulder fractures).

Future research should focus on methodologically well conducted prospective comparative outcome studies to evaluate the rate of functional recovery, cost-effectiveness, and outcomes associated with these treatment methods in which the population is clearly described regarding age, sex, bone quality and severity of the fracture. To contribute to higher quality of evidence, the studies need to have sufficiently long follow-up (more than a year) and use validated measurement methods.

Health economic aspects should be included in future studies, as there are insufficient long term cost effect analyses available.

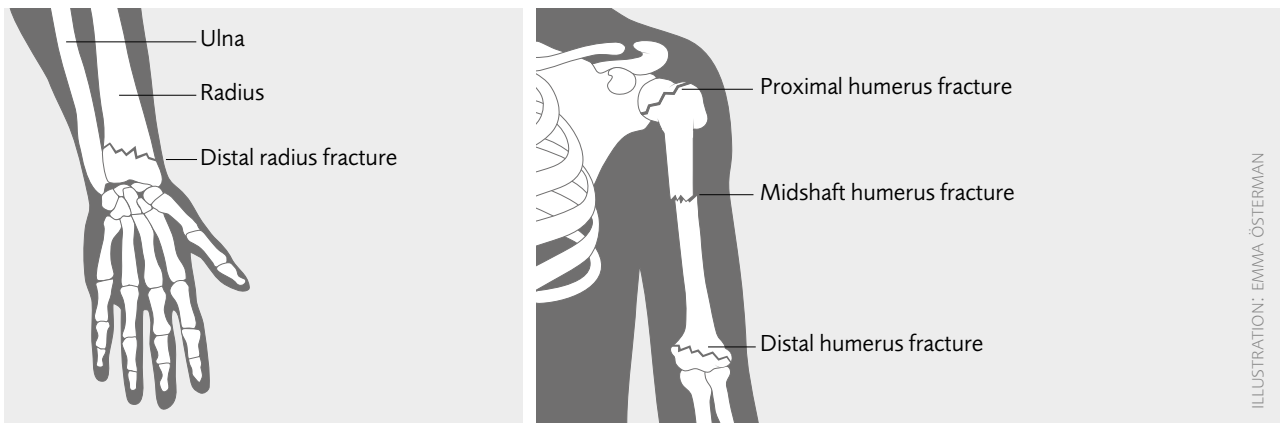
No studies that addressed the experiences or the participation of elderly patients who specifically had arm fractures regarding their contact with the health care system were found. Future studies should present results for both men and women.

Ethical and social aspects

In Sweden, the proportion of patients receiving surgical treatment of arm fractures has increased despite evidence that surgical treatment does not lead to any clear health benefits compared to non-surgical treatment. If this trend continues, it could undermine the ability of the health care system to provide other health care interventions.

An arm fracture due to a fall may be a sign of osteoporosis, causing many patients to begin worrying that they might sustain another fracture. As a result, they may avoid going out, using public transportation, or even leaving their homes entirely because they fear they will fall again. This can, in turn, lead to increased isolation and reduced social interaction.

Health care professionals, who meet people with osteoporosis, should be familiar with current evidence, take the individuals seriously and provide accurate information. Patients may experience additional pain and suffering if their treatment is delayed because they encounter caregivers who are not sufficiently informed about osteoporosis.



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