

# PROXIMAL FRACTURE OF THE FEMUR ON THE ELDERLY: WHAT'S THE BEST TREATMENT?

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## ABSTRACT

The proximal fractures of the femur on the elderly represent a serious problem inside the public health context, because of the high economic costs needed for the treatment and its consequence, as the high taxes of morbidity and mortality. The goal of this study was to discuss, through a literature revision, which is the most indicated treatment for the proximal fractures of the femur, on the elderly. The researched data bases were MEDLINE, COCHRANE and PEDro. The inclusion criterions were published studies on the last seven years, only on the Portuguese, English and Spanish languages, accomplished on human beings, with no genre distinction and with ages above 60 years old, with

methodology draw of clinic research, random clinical research and systematic revisions with and without meta-analyses. Seven articles were found and after the analysis, it can be affirmed that there is no specific treatment for the proximal fractures of the femur on the elderly. The normal treatment indicated in most of these fractures is chirurgic and it requires physiotherapy involvement for an adjusted rehabilitation. Despite of the difficulty to compare the studies, was observed that a team of health professionals seems to promote a more effective rehabilitation, beyond prevent complications.

**Keywords:** *Elderly. Hip fracture. Rehabilitation. Surgery.*

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## INTRODUCTION

As a result of infectious-contagious diseases control and the improvement of quality of life, the mean life expectancy of the population has increased and tends to grow further.<sup>1,2</sup> Third age shows a fast growth in the country, corresponding to approximately 260,000 elderly individuals each year.<sup>3</sup> There are several consequences, including an increased incidence of chronic-degenerative diseases. In addition, in this stage of life, the potential to fall is enhanced, and the incidence of hip fractures has reached alarming rates.<sup>1</sup> It is estimated that, in 2050, approximately 6.5 million hip fractures will occur around the world.<sup>1</sup>

The increased incidence of these fractures, in the age group above 60 years, is due to osteoporosis and risk factors such as the presence of associated diseases (comorbidities), previous history of falls, tobacco use, and body mass index below 18.5 kg/m.<sup>2-4</sup>

The most common kind of fracture is the proximal femoral one. This kind of fracture can be divided into intra- and extracapsular.<sup>5</sup> Intracapsular fractures are identified as the femoral neck ones, while extracapsular fractures involve transtrochanteric fractures, with intertrochanteric being the most common one.<sup>5</sup> These proximal femoral fractures are regarded as a serious problem in the context of public health, due to its high treatment costs and consequences, as well as to its high morbidity and mortality rate.<sup>5</sup> The mortality rate associated to proximal femoral fracture in the

elderly is 12% - 37% after one year<sup>5,6</sup>, but one of 15 elderly individuals with hip fractures die in hospital.<sup>2</sup> The major factors mentioned in literature as predictive for mortality after a fracture are age<sup>1,2,5-7</sup>, comorbidities, cognitive status<sup>2,5-7</sup>, the time span between fracture and surgery, and the kind of anesthesia used for surgery.<sup>5</sup> Some complications found after surgical interventions are also life-threatening, mostly infections, followed by pseudoarthrosis and deep venous thrombosis.<sup>8</sup>

Usually, treatment for these fractures is surgical. Conservative treatment is only indicated for some fractures classified as incomplete or without deviation.<sup>2</sup> The selection of the best fixation method and the appropriate technique are based on age, mobility degree, mental status and on the pre-existent diseases that may interfere on surgical and/or rehabilitation process.<sup>4</sup> The most frequent indications are synthesis material inserted by means of internal fixation, total arthroplasty, and hemiarthroplasty or partial arthroplasty. Conservative treatment, i.e. non-surgical, is usually limited to in-bed patients, unable to walk or presenting absolute contraindications to surgical intervention.<sup>4</sup>

Considering the importance of rehabilitation for an individual, the treatment of proximal femoral fractures requires a multidisciplinary approach to provide clinical care and appropriate follow-up.<sup>4</sup> Physiotherapeutic treatment is indicated for preventing fracture complications and for the rehabilitation, either when submitted to surgical or conservative treatment. The objectives include

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providing a faster functional return of the affected individuals and avoiding potential complications. However, there is no consensus regarding the best approach and the best outcomes of a physiotherapeutic intervention. Several authors have demonstrated the importance of acting preventively to fractures and in rehabilitation programs, with the goal of providing the elderly with a faster return to their daily life and functional activities.<sup>2,5,6</sup> Treatment is known to be important for functional recovery and for the survival of these patients, but the effectiveness of some techniques is still not well established.

Therefore, the purpose of this study was to discuss, by means of a literature review, which treatment (surgical or conservative) should be indicated for proximal femoral fractures in an elderly population, as well as their outcomes.

## METHODS

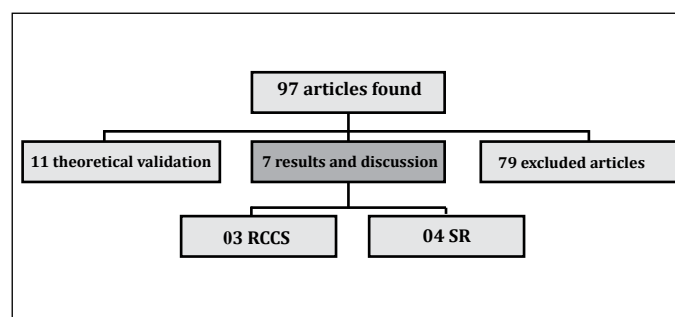
For conducting this study, MEDLINE, COCHRANE and PEDro databases were employed. The keywords we searched for in literature were *hip fracture*, *hip arthroplasty*, *rehabilitation* and *elderly* as well as similar words in Portuguese, using DECs as a reference.

Inclusion criteria: studies published in the last eight years, in Portuguese, English and Spanish, conducted on human beings of any gender, above 60 years old. Randomized and non-randomized clinical assays, systematic reviews with and without meta-analysis were also considered as inclusion criteria. Studies failing to meet these criteria were automatically excluded. Some references indicated on selected studies have been used for full text reading, since they fulfilled all inclusion criteria.

## RESULTS

The initial search included 97 studies, which were selected by title for abstract reading. From this reading, 7 studies were selected to be fully read to discuss the proposed objective, accor-

ding to the inclusion criteria. The result of the search is found on Figure 1.



**Figure 1** – Result of articles found on Medline, Cochrane and Pedro databases, considering their use as data for this study.

RCCS – Randomized Controlled Clinical Study, SR - Systematic Review

In the selected studies, all patients showed proximal femoral fracture, and were submitted to different interventions. The characteristics of the selected studies are found on Table 1.

## DISCUSSION

The selected studies described different interventions and results, considering the objective of proposing and assessing the best treatment, either surgical or conservative, for proximal femoral fractures. We could notice that the best treatment response in elderly subjects with proximal femoral fracture was found in those submitted to surgical intervention and receiving intensive rehabilitation under multidisciplinary or interdisciplinary care. Parker et al.<sup>9</sup> performed a systematic review in which they compared a surgical treatment to a conservative one. The authors selected five studies assessing a total of 428 elderly individuals with proximal femoral fracture. One of those studies addressed intracapsular fractures, while the others, extracapsular fractures.

**Table 1** – Characteristics of the 7 selected studies concerning study type, studied n, year of publication, suggested treatment and endpoint studied by authors

Author	Study type	Studied N	Year of publication	Suggested treatment	Endpoint
Parker et al.	SR	428	2000	Comparison of conservative vs surgical treatment	Hospitalization time is shorter when submitted to surgery, as well as the time to return to DLAs
Parker et al.	SR	2694	2006	Comparison of internal fixation vs total hip arthroplasty	Internal fixation is associated to less surgical trauma and to a better recovery, but the risk of a new intervention is higher
Ekstrom et al.	RCCS	203	2007	Comparison of proximal femoral fixation and Medoff Sliding Platform (MSP)	There was no significant difference between both techniques. MSP showed a lower recurrence rate
Handoll et al.	SR	1065	2006	Assessment of mobilization strategies after surgery	No sufficient evidences to corroborate effectiveness of the intervention
Cameron et al.	SR	1887	2001	Comparison of coordinated multidisciplinary internal rehabilitation (CMIR) vs conventional orthopaedic rehabilitation	CMIR showed better results, but no statistical difference was found
Huusko et al.	RCCS	260	2002	Comparison of intensive geriatric rehabilitation (IGR) vs usual orthopaedic rehabilitation	IGR showed a shorter time to return to DLAs, and patients remained in hospital for a shorter period of time
Naglie et al.	RCCS	279	2002	Comparison of interdisciplinary care vs usual orthopaedic care	Interdisciplinary care provides better results, without statistical difference.

SR – Systematic review, RCCS – Randomized Controlled Clinical Study, COG – Cognition, FUNC – Function, DEP – Depression; DLAs – Daily life activities

The authors discussed the different surgical techniques employed, which seemed not to have influenced studies outcomes. The discussed conservative treatment was limited to restricted mobilization in supine position. The authors concluded that surgically treated patients presented lower risk to fracture union failure, shorter hospitalization time, but did not present significant difference when the return to DLAs was assessed.<sup>9</sup> However, physiotherapeutic treatment was limited to restrict mobilization in supine position, which cannot be regarded as a specific treatment for hip muscles, and, also, this treatment has not been proven to be specific for function and/ or balance exercises. Thus, the absence of significant results concerning return to DLAs can be attributed to the absence of a specific treatment. The same group of authors conducted another systematic review in 2006 comparing total arthroplasty and internal fixation in intracapsular fractures in an elderly population. They selected 17 studies and found that surgery duration, bleeding and the risk of deep infection were significantly lower in individuals submitted to internal fixation. However, the number of surgery reviews or complications was significantly lower in the group submitted to total arthroplasty. Thus, although internal fixation produces less surgical trauma, arthroplasty was found to be a more reliable, functional and less risky alternative for elderly individuals. Furthermore, those submitted to cemented arthroplasty evidenced significantly reduced pain and better functional performance.<sup>10</sup> For being out of the scope of this study, the authors did not make any mention about the physiotherapeutic treatment used in the assessed studies. Thus, we could not discuss if the results found for pain relief and functional performance were influenced by the physiotherapeutic approach employed.

Among surgical techniques used in elderly patients, Proximal Femoral Fixation (PFF) and the Medoff Sliding Platform (MSP) have produced good results in patients with proximal femoral fractures. Ekstrom et al.<sup>11</sup> compared the functional results between both techniques described above. The authors conducted a randomized clinical study on 203 patients with trochanteric fracture (n=172) and subtrochanteric fracture (n=31), followed up for twelve months after surgery in order to assess function. After six weeks, 88% of the group submitted to MSP were able to walk 15m, a result regarded as significant by the authors. However, within a year, variables ambulation, pain, hip abductor muscles' strength, life status and fracture union did not show relevant differences between both treatment groups. The authors concluded that the group submitted to PFF was able to ambulate within a shorter period of time and the group with MSP presents a lower rate of surgical review due to complications. Once again, the objective of those authors was to compare results according to the surgical technique, despite of having assessed physical and functional variables.<sup>11</sup> They do not describe the kind of physiotherapeutic treatment employed, thus not enabling to check if the results were influenced by exercises and other activities.

On the other hand, after surgery, some strategies are known to improve and restore patients' mobility, always targeting functional independence, whether by orthostatic stance or by gait. From a surgical point of view, cemented arthroplasties allow load release after 48 hours, but an arthroplasty using graft requires at least three to four weeks to allow load release. Therefore, even if a surgical technique does not show differences, the kind of material employed and the kind of fixation provided by that material may contribute to functional improvements, simply because the patient is released for practicing the activity, generating stronger confidence and a more positive emotional status.<sup>12</sup> However, these factors should be better investigated

by means of future studies.

In order to postoperatively investigate the effects of treatment strategies, Handoll et al.<sup>13</sup>, conducted a systematic review containing 13 different studies involving elderly patients with proximal femoral fractures. Among the exercises performed, quadriceps muscle strengthening and gait exercises provided the strongest benefits for mobility and balance. Despite of the results found, some of the included studies presented low method quality, making comparisons among them and evidences corroborating the effectiveness of the interventions difficult. The authors discussed that the diversification of physiotherapeutic exercises seems to be a positive factor for treatment due to physical and functional differences between patients as well as to the characteristics of each injury. Another factor that apparently can influence results was cognitive and emotional response, which presents a wide variability in this kind of population. These findings point out to the need of conducting studies with reliable methodology, controlling potential confusing variables, such as, for example, differences on the cognitive status and on treatment programs, which can cause bias when interpreting outcomes.

Cameron et al.<sup>14</sup>, developed an experimental study in 2001 in order to investigate the effects of a treatment named Coordinated Multidisciplinary Internal Rehabilitation (CMIR) compared to Conventional Rehabilitation (CR). CMIR was led by a geriatrician or physical therapist, counting also on a nurse and an orthopaedic doctor in the team providing patient support. Among the goals of the treatment, early mobilization, load release as soon as possible, transfer drills, and functional drills for a gradual return to DLAs were recommended.<sup>9,11,12</sup> CR was based on orthopaedic follow-up, not always followed by the physical therapist. In these cases, physiotherapy occurred when the family asked for it or depending on the authorization of health insurances. Despite a potential variability in these rehabilitation programs, even regarding their sequence, the results found by the authors suggested that elderly individuals with proximal femoral fractures should seek CMIR as a treatment of choice, because it provided a better functional performance.<sup>14</sup>

Additionally to the impact of hospitalization after a fracture, there are other factors influencing healing in the elderly, such as the presence of comorbidities, changes on cognitive ability and the presence of depression. These factors, either associated or alone, can compromise and contribute to a worse health status for the elderly, making long-term prognosis uncertain.<sup>15</sup> The presence of depression and painful symptoms in the elderly, quite common among hospitalized patients, are responsible for favoring immobility.<sup>16</sup>

Concerning hospitalization time, Huusko et al.<sup>17</sup> found that elderly individuals with proximal femoral fractures remained, in average, 34 days in hospital after intensive geriatric treatment (CMIR). Elderly individuals submitted to CR remained in hospital for about 42 days. Although there were differences, the result concerning the best kind of intervention and rehabilitation was controversial, once, in the long term, patients' clinical picture was similar. The greatest benefit after a CMIR in the reviewed studies was concerned to a faster return to DLAs and a better function among the elderly.

A multidisciplinary approach has been currently suggested, joining several different kinds of professionals to work together. There are indications that the results of this approach may vary, but, for involved patients, the effects seem to be positive, accelerating the rehabilitation process. This condition was found by Naglie et al.<sup>18</sup> The authors compared interdisciplinary care to conventional rehabilitation in 279 patients. Included in the

interdisciplinary care team were the same professionals previously mentioned for CMIR treatment, but adding an occupational therapist and a social worker. The authors found that, after 6 months of therapy, transfers and gait showed improvement in the group submitted to interdisciplinary care. The authors also outlined that these benefits were stronger in elderly individuals with lower cognitive deficit. They suggested that a training program based on specific strengthening sessions associated to cognitive stimulation treatment may prevent worsening of the health status in the elderly.<sup>18</sup>

## CONCLUSION

By reviewing the selected studies, we can say that there is no specific treatment for proximal femoral fractures in the elderly. Results have demonstrated that surgical treatment followed up by a healthcare team seems to promote a more effective rehabilitation and minimize any worsening of their health status. However, further studies are warranted to prove the effectiveness of physiotherapeutic treatment.

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