Optimal treatment of hip fractures

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At the orthopedic departments in Sweden, the hip fracture patients continuously occupy up to one third of the bed resources. Hip fractures in Sweden consume more hospital days than all the cancer patients together. In the middle of the 1980s, the annual number of hip fractures amounted to 6,500 in Denmark, 4,500 in Finland, 260 in Iceland, 6,000 in Norway and 14,000 in Sweden. The calculated number of hip fractures in the year 2000 is dependent on if the prognosis is based solely on the increasing number of elderly in the population or if also the increasing incidence during the last decades is included. An increase up to the year 2000 of 50–100 percent is prognosticated for Scandinavia. The proportions cervical/trochanteric fractures varies. In Norway and Sweden it is close to 1/1, whereas Iceland and Finland have more cervical than trochanteric fractures. In Iceland, however, trochanteric fractures are increasing. Finally, in all of Scandinavia, 3 out of 4 hip fracture patients are women.

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Operative treatment

Practically all hip fractures require an operation to permit the patient to regain her/his earlier level of function, which is the goal for the treatment. The operation is performed as soon as practicable, usually within the first 24 hours after the fracture. It is the task of the orthopedic surgeon to stabilize the fracture in such a way that full weight bearing and walking training can commence as early as on the day after the operation.

Cervical fractures constitute half of the hip fractures. The circulation within the marrow cavity and subperiosteally on the femoral neck is of great importance for the healing of the cervical type of fracture. The blood supply of the femoral head passes through vessels situated subperiosteally along the femoral neck and within the bone. Depending on the dislocation of the cervical fracture, these vessels are more or less damaged at the moment of fracture. Decreased vascularization to the femoral head can cause pseudarthrosis, which clinically becomes obvious usually within the first year after the fracture.

Another effect of disturbed circulation is weakening of the femoral head (called femoral head necrosis or segmental collapse), appearing after the fracture has healed, usually 1–2 years after the fracture, when new blood vessels grow in and the bone is rebuilt.

With scintimetry it is possible to predict the healing after cervical fracture. Decreased isotope uptake in the femoral head of the fracture side predicts pseudarthrosis or segmental collapse (11).

Around 30 percent of the patients with a cervical fracture will develop some type of healing complication (4, 5, 6).

Nailing has been shown to result in more healing complications than such methods as predrilled pins or screws. These latter methods are considered more benign as regards the residual circulation in the femoral head, and their introduction has reduced the frequency of healing complications to around 20 percent. Half of these patients, i.e., totally around 10 percent of the cervical fractures, develop so many symptoms that they need a second operation with a hip arthroplasty (10).

It is important with rapid awareness of functional deterioration after a period of successful postoperative mobilization in the patients with healing complications (8). An accurate repositioning of the fracture and positioning of the pins or screws are important, and a good image intensifier, preferably biplanar, is necessary.

Cervical fractures can also be treated primarily by hip arthroplasty. In the United States and in England, this method of treatment predominates, usually with the motivation that no healing complications can develop when the fracture has been removed. However, other possibilities of complications are thereby introduced, such as dislocation or loosening of the arthroplasty. The mortality is also higher with this larger type of operation. In Scandinavia, primary osteosynthesis has always dominated, and this method of treatment is now also gaining increased interest in the United States.

In trochanteric fractures the circulation is good, and healing complications are unusual. Osteosynthesis with sliding screw-plate is predominating treatment. A minor part of the trochanteric fractures are comminuted, and early direct weight bearing is thus impaired.

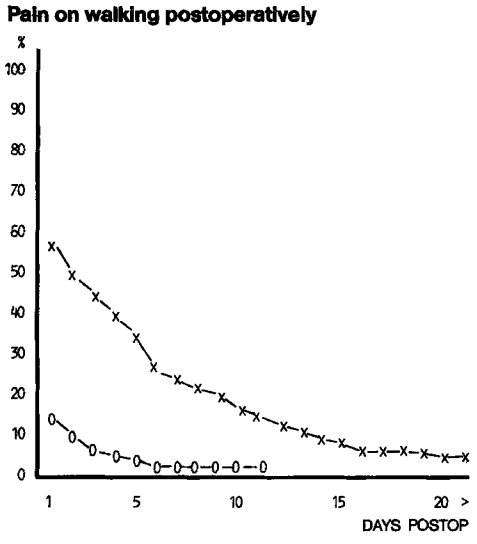

Figure 1. Pain on walking postoperatively. Percentage of 112 trochanteric (x-x-x) and 139 cervical (0-0-0) consecutive hip fracture patients.

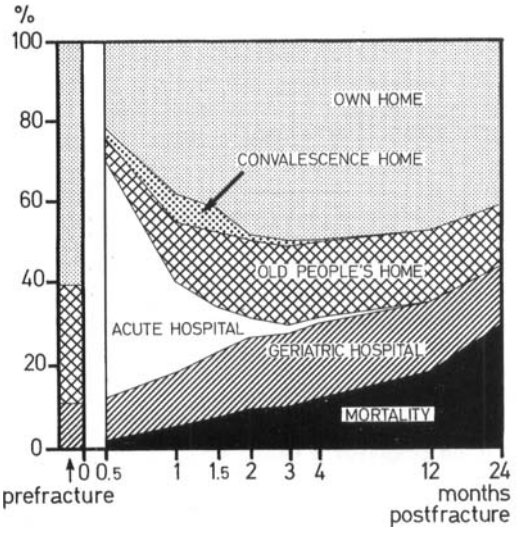

Figure 2. Residency at different periods (logarithmic scale) after hip fracture of all the cervical and trochanteric hip fractures occurring in Lund during 1 year.

Rehabilitation

After the operation, the important walking training and readjustment to the earlier life pattern begins. The orthopedic surgeons radically changed their opinion on mobilization and rehabilitation at the end of the 1960s. In the Scandinavian countries, early weight bearing was introduced after osteosynthesis.

Since the middle of the 1970s, an active program for treatment has been introduced at the orthopedic department in Lund, in the later years combined with intensified cooperation with the primary health care system (1, 2, 3, 7, 9, 12). Walking starts on the day after the operation. This facilitates a rapid functional readjustment. Based on 251 consecutive patients who were asked daily, it was found that patients with trochanteric fractures have more pain when walking than patients with cervical fractures during the first 2 weeks postoperatively (Figure 1). This is probably due to the greater extent of the trochanteric fractures.

In Lund, with around 320 hip fractures occurring annually among 200,000 inhabitants, two thirds of the patients with hip fractures come from their own homes and one third from old people's homes, acute hospitals, mental hospitals, or geriatric clinics (Figure 2). Of the patients coming from their own home, the majority return home after 2–3 weeks of treatment at the orthopedic departments. The rest of the patients are rehabilitated in institutions for diseases contracted before their fracture. Eighty percent of the patients are in their own homes again before 4 months have passed after the fracture (12).

Analysis of the residency for the patients before and after the fracture provides important data, and is an indicator of the functional outcome.

Thus, the profile of rehabilitation for patients in Lund, where an active rehabilitation program has been introduced, reveals a picture in which the majority of the patients coming either from their own homes or from old people's homes have returned within 2 months to their previous habitat (Figure 3).

The majority of the patients coming from their own homes walked without walking aids or with a cane before their fracture (Figure 4). Soon after the operation, the majority regain this walking ability. Activities of everyday living, such as dressing and washing, are regained usually within the first month. To be able to walk outdoors and to visit friends increases successively up till 4 months after the fracture. Also domestic activities are regained by most patients within the first month after the fracture.

The rehabilitation program only temporarily increases the need for home-help service (7). Before the fracture, 30 percent of the patients had home help, and after the fracture 40 percent had home help. The patients receiving home help before the fracture had, on an average, 4 hours of help weekly, which rose after the operation and discharge from hospital to 6

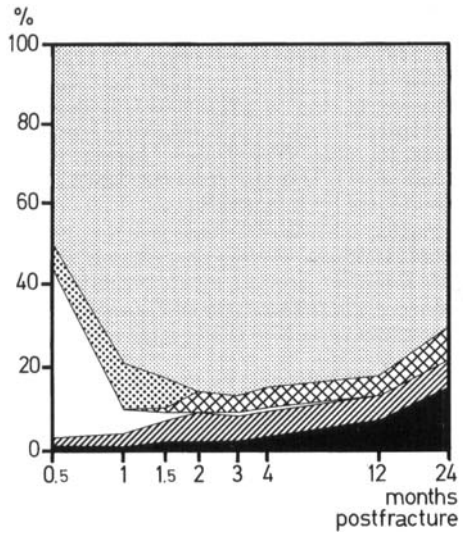

Figure 3. Residency at different periods (logarithmic scale) after a cervical hip fracture for all the patients admitted from their own homes during 1 year in Lund.

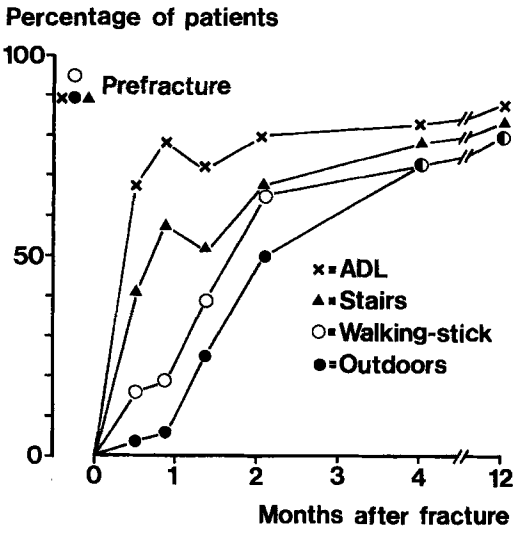

Figure 4. Percentage of surviving patients at different time periods after a hip fracture managing such functions as dressing/personal hygiene (ADL), climbing stairs, ambulation with a cane (walking stick) or no support, and outdoor activities.

hours weekly. Thereafter, it declined again. The program thus cannot be considered as placing an increased resource demand on the health and social services system.

The future

The future evolution as regards resource-consuming hip fractures includes improved prevention against falls and bone fragility. To date, no practical solutions have been achieved. Further, such improvements will not have any impact on the increase in patients predicted up to the year 2 000 (13).

Recently (supported by the Swedish Orthopedic Society and the Swedish Medical Research Council), a registration project called "National Hip" was launched, with recording of treatment data and outcome of all the hip fractures occurring in Sweden. These patients are followed up through the entire treatment chain, with hospitalization time at the orthopedic and surgical departments placed in relation to the percentage of direct discharge of the patients' to their own homes or to other rehabilitation units. The functional outcome is related to the patient's preoperative abilities, as well as the consumption of institutional resources. With this multicenter hip fracture study ("National Hip"), the results of optimized hip fracture treatment is expected within 10 years to reduce the consumption of hospital resources by this group of patients. With a shorter stay in the hospital, resources for other patients are liberated. Thus, it would seem that the expected doubling of the number of hip fracture patients up to year 2 000 can be satisfactorily met with the bed resources that are available in Sweden.

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