Fractures in the elderly

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Current major orthopedic problems are dominated by the demands from the elderly to live an independent, mobile and painfree life. At the same time society has a strong demand on the elderly to be able to fulfill this. Diseases and trauma of the locomotor system have a dominating influence on the elderly's ability to perform everyday activities. With increasing age many problems are focused around the hip joint in the form of fractures and also development of arthrosis.

Hip fractures have increased dramatically in number in Scandinavia as well as in other western countries during the last three centuries. This increase will continue both due to an increase in the number of elderly in the population and also due to an increase of the risk of hip fractures particularly in the oldest persons, those being above 80 years. This constitutes a threat to hospital resources. These patients have also other diseases that need treatments and the hip fracture can initiate a sequence of treatment in different levels of care. However, the prognosis for the individual patient has improved markedly due to improved treatment methods including active rehabilitation. Now the majority of hip fracture patients can return rapidly to their own home and achieve the same level of function as before the fracture.

The hip fracture has been called "the widow's disease". Of the patients, 75% are women and 50% are living alone. The high proportion of women is explained both by a high amount of women in higher ages and by their increased osteoporosis. Hip fractures below 50 years of age are rare and constitute only 2% of all hip fractures in Sweden. The risk of achieving a hip fracture increases exponentially from 50 years of age. The mean age at fracture is around 80 years. The life time risk for a woman to achieve a hip fracture has been calculated to 20% and among those who reach 90 years of age almost every second woman has had a hip fracture. In Sweden now 18,000 hip fractures occur each year, of which about half are femoral neck fractures and the other half trochanteric fractures. A smaller amount of fractures are baso-cervical and subtrochanteric (Table 1).

Table 1. In the Swedish National Hip Fracture registration (RIKSHÖFT) 15,000 fractures were classified by the orthopedic surgeons

Fracture type	Percentage
Undisplaced cervical fractures (Garden I + II)	17.2
Displaced cervical fractures (Garden III + IV)	37.0
Baso-cervical fractures	3.1
Trochanteric two-fragment fractures	23.1
Trochanteric multi-fragment fractures	14.6
Sub-trochanteric fractures	5.0

The number of elderly persons with hip fractures have doubled during the last two decades. The expected number of hip fractures in the beginning of the next century can be calculated based on the expected increase of the number of elderly in the population and based also on the increased risk of hip fracture i.e. the incidence increase. A further increase during the first decade of the new millennium of up to 50 percent compared to the beginning of 1990 is to be expected. The increasing incidence is higher in urban than in rural populations, which has been ascribed to the more sedentary lifestyle in the city compared to the countryside. Almost half of all hip fractures occur in patients above 80 years. This age group is at the same time more difficult to rehabilitate due to other concomitant diseases.

Fractures are due to a combination of the fragility of the bone tissue (osteoporosis) and a force directed towards the bone, usually due to a fall. Most of the patients fall indoors, especially during walking or raising from a chair. With increasing age osteoporosis is increasing as well as the falling tendency. Fractures linked to osteoporosis, the so called fragility fractures, usually include the hip fractures, the vertebral fractures, fractures of the distal radius, fractures of the proximal humerus, ankle fractures and pelvic fractures. In Sweden, patients with hip fractures occupy 25 percent of the total number of bed days for orthopedic treatment. They are the group of diagnosis among all types of operated patients that consume most bed days irrespective of speciality. All the fra-

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gility fractures have increased their incidence during the last decades. The hip fractures however are most resource consuming. The other fractures consume less bed days. Many vertebral fracture patients are treated as outpatients. Those with a period of intense pain need temporary hospital care during the healing of the vertebral compression. Most of the fractures of the distal radius are treated as outpatients, usually with reposition and application of a cast.

Osteoporosis, general disability from diseases and falling tendency increase with age. To prevent osteoporosis the general recommendations in Sweden consist of sufficient intake of calcium in the diet, production of vitamin D by exposure of the skin to sunshine and exercise. In the Scandinavian countries many persons achieve enough calcium intake (800–1000 mg/day) by drinking milk and eating cheese. In Sweden the low-fat milk is fortified with vitamin D. Recently a strong emphasis has been put on exercises for the elderly. The importance of building up a strong skeleton during youth and to maintain the bone mass through continued weight bearing activities is emphasized and organized activities such as walks and dancing for the elderly are recommended. Dancing also gives training of balance and proprioception. Estrogen prophylaxis gains increased interest. Recent knowledge has shown that it has to be continued for at least 10 years and after stopping medication a successive development of osteoporosis starts. This seems accelerated during the first years of withdrawal of the estrogen treatment. The drawbacks with estrogen treatment are increased risks of uterus- and mammary cancer. The risk of mammary cancer is increased 30–50 percent. Estrogen treatment is now in Sweden only recommended to risk groups with low bone mass. This can be measured with densitometry. Even if a large scale prophylaxis is started to women now entering menopause this will not have any impact on the increasing number of hip fractures expected during the coming two decades.

Increased interest has been focused on the falling tendency of the patients and efforts have been made to increase the balance and muscle strength in elderly persons. Insecurity and fear of falling due to a decreased balance capacity can lead to decreased physical activity which in turn leads to a decreased balance capacity. With adequate information and training probably such a vicious circle can be prevented.

The treatment of hip fractures in the elderly is based on a good osteosynthesis stabilizing the fracture. This is the prerequisite for immediate weight bearing and walking training. The functional outcome is an important parameter and the goal is to rehabilitate the patient to the same living conditions as before the fracture.

To analyze the importance of increasing age for the treatment of hip fracture patients, an analysis has been made of data from 23,000 patients in the national RIKSHÖFT investigation. Before fracture younger patients mainly lived in their own home and with increasing age more in old people's home. Patients aged 60–69 years lived before fracture in 86% in their own home and in 4% in old people's home whereas the rest were treated in bed in nursing homes or geriatric hospitals. Among patients 90–99 years of age 41% lived in their own home and 43% in old people's home. Both these types of living can be considered independent compared to geriatric hospitals and nursing homes. It is interesting that in all age groups around 80% of the patients lived in some kind of independent living. The fracture types changed somewhat with a dominance of cervical fractures in younger ages and an increasing proportion of trochanteric fractures with increasing age. For the higher age groups the ratio cervical to trochanteric fractures was around 1. The increasing number of trochanteric fractures with age is in accordance with data indicating more osteoporosis in trochanteric fractures whereas there has been difficulty to show osteoporosis in the femoral neck fractures.

The mean treatment time in the orthopedic department increased with age. For the age group 60–69 years the mean time in the orthopedic department was 14 days and the median 10 days. For the age group 90–99 years the mean time was 21 days and the median 14 days. There was a successive increase for the age groups in between. The possibility to discharge the patients directly from the operating department back to origin decreased with age. Of those patients coming from their own home in the age group 60–69 years, 69% could return directly from the orthopedic department to their origin. For the age group 90–99 years the direct return home was 29%. Of those coming from old people's home the direct return was 57% and 53%, respectively, for these age groups. With increasing age the mortality due to other diseases increased. For patients 90–99 years the four month mortality was 30% whereas of the survivors the majority were back in their origin within 60 days from fracture, many of them having needed institutional rehabilitation in between. Thus, even patients originally living in their own home can be rehabilitated there in spite of a high age.

For arthrosis of the hip no increasing incidence has been shown in Sweden. However, in Sweden there has been a large increase in the number of hip arthroplasties during the 1970's and beginning of the

1980's. This was due to a great number of unoperated patients waiting for treatment. Due to the good long-term results with cemented hip arthroplasty with more than 95 percent retainment of the prosthesis after 10 years and the optimized operating technique, the age limits have been expanded both to younger age groups, i.e. down to 40 years, as well as to the higher age groups, where no upper numerical limit exists in otherwise healthy patients. The operations have been decentralized to smaller hospitals and are performed there on a large scale. The number of performed hip arthroplasties has increased successively to a level of around 13,000 per year during the years 1991–1992 in Sweden. Thereafter there has been a decrease of around 12 percent during 1993 to around 11,400 hip arthroplasties. This is due to decreased hospital resources. Data for 1994 shows also this lower production level. The decreased production and an unchanged demand from the patients has resulted in increased waiting lists and again a queue situation exists in many hospitals in Sweden. For the Swedish 8.5 million population the calculated yearly need of hip arthroplasties is 13,000–14,000 and for knee arthroplasties 6,000–7,000. This is expected to remain during the coming decade.

It is evident from the figures presented above that osteoporosis and arthrosis constitute major causes for disability in the elderly and both the individual patient and the society will benefit from optimized diagnosis and treatment. There is a great need for efficient indicators of disease and treatment.

The role of molecular markers for joint and skeletal diseases will be highlighted during this symposium. Markers are potentially useful as diagnostic tests, for measure of severity of disease or trauma, for prognosis as well as for measure of treatment response. Generalized and localized conditions probably need different markers. Future experience will reveal their usefulness.

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