

Healthy Skeletal Ageing; Bones and More

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- Dr Vijay A Kulkarni

Skeleton is the framework of the body. It is made up of individual units that is bones which come in different shapes and sizes. Connected to each other with ligaments and gliding against each other smoothly with the help of congruently articulating cartilage in turn forming joints which give us mobility.

Wrapped around the bones arising from one point on the skeleton to insert into another are the muscles which give us the strength and leverage to flaunt the mobility and functionality of an otherwise rigid skeleton.

Even the strongest built animals suffer weakness of bone and wear and tear of joints due to ageing. Skeletal ageing also happens with time as a very natural physiological process. Skeletal ageing also gets affected by variables apart from time.

The most commonly encountered skeletal issues in elderly are fractures due to simple falls like a hip fracture. This scenario will be used to exemplify and discuss the causes problems impact and possible preventive aspects of effects of skeletal ageing.

Case scenario:

An 80-year-old elderly woman comes to the emergency with history of simple slip and fall in the bathroom following which she is not able to walk. She has complaints of pain in right hip.

A trained orthopaedic surgeon or emergency physician notices that the right leg is short and rotated.

On x ray a diagnosis of fracture of the neck of femur is made. In other words, the ball of the hip is fractured.

Patient is evaluated for comorbid conditions like high sugars, high blood pressure and other ageing related issues.

Patient is operated after optimisation of fitness and the broken ball of the hip is replaced.

Patient is made to walk very next day after the surgery with support.

Issues

1) why did the patient fall?

Elderly patients have higher risk of falling, especially domestic (at home) mechanical falls. Studies have suggested that 40 to 50% of elderly aged over 80 fall at least once a year.

Leading causes of fall in elderly are

- a) simple mechanical fall - a stumble leading to fall
- b) age related neurological balance issues like parkinsonism or a mild stroke leading to the fall.
- c) fluctuation of sugars (very high or very low sugars in diabetics) causing a fainting episode leading to the fall
- d) electrolyte imbalance like decreased sodium levels leading to balance issues and a fall.
- e) crooked knees like bow legs or knock knees in elderly due to osteoarthritis or wear and tear of joints can lead to buckling and fall

2) How is ageing directly related to the fracture in this patient?

As most of the people know broken hip in elderly is a common occurrence after a simple fall. The reason of such easy breakage or fracture of bones in elderly is due to severe weakness of bones called osteoporosis. This leads to weak points in the specific areas of bones causing risk factor of fracture in those areas. These fractures are called fragility fractures.

Common fragility fractures in elderly

- a) fracture around hip joint
- b) fracture at the wrist
- c) compression fractures of the spine
- d) fracture around the shoulder.

The list continues.

Cause for Concern and impact of patient and family

- 1) Physical stress – pain due to injury and surgery
- 2) Psychological stress – dependency of patient on the family and apprehension of fall again in the future
- 3) financial stress – the financial burden of the fracture in an elderly is considerably big on the whole family.
- 4) morbidity and mortality – a very high percentage of hip fracture patients suffer problems such as bed sores, pneumonia, deep vein thrombosis, etc and in some cases death ensues due to such complications.

How to Prevent Osteoporosis and Accidental Falls?

Osteoporosis in elderly is usually an identifiable loss of bone stock and structural integrity contributing to weak bones.

Preventive Measures for Osteoporosis; In Essence Healthy Bone Ageing

1) maintain bone strength – sedentary lifestyle in elderly has direct causal relation with weakness of bones. Repetitive muscular activity and exercises tend to maintain bone strength. A programmed and individualized exercise routine tends to maintain bone strength.

2) nutrition and medications – an optimal Protein intake and Calcium and Vitamin D supply are of utmost importance to bone strength. With ageing ability to maintain mineralisation of bone and conversion of adequate Vitamin D decreases.

Supplementary Calcium and Vitamin D in the form of injections and oral preparations have shown promise in reducing osteoporosis in elderly.

Medications like bisphosphonates, calcitonin teriparatide have been used with good results in increasing bone density in elderly. Do talk to your Doctor about these options and seek advice.

How to Prevent Falls?

Statistically a fall in elderly individual leading to fracture would also mean increased risk of further fall and decreased activity level due to fear of fall. Prevention of fall will essentially be addressed by maintaining good Musculo-skeletal strength by exercises and addressing the causes of fall like balance issues and low sugars and stroke.

Early identification and treatment of senility associated neurological problems like Alzheimer's and Parkinsonism can decrease neurological causes of fall. Maintaining optimal sugar levels with the help of the Physician or Diabetologist will definitely decrease chances of fall.

One very crippling skeletal problem in elderly individuals is **osteoarthritis** of knee causing the knees to hurt in turn causing limited mobility contributing to muscle and bone weakness. Also, this condition causes deformities like knock knees and bow legs in elderly.

Prevention or slowing of osteoarthritis can be achieved by maintaining healthy lifestyle and keeping the weight in check.

In case of already ensued osteoarthritis a total joint replacement of knees provides pain relief, deformity correction, scope for exercise and activity like walking in turn increasing bone strength and preventing falls.

Take away Message:

Healthy bone ageing involves active lifestyle preferably from younger days which translates to healthy ageing of bone and joints. Maintaining good health and keeping age related issues like diabetes, hypertension in check. Periodic consultations with physician for assessment of bone strength optimal control of comorbidities like diabetes. Diet and medications and supplements for bone strengthening on physicians advise if required.

If even after all precautions there is a fall an attempt to mobilise the elderly should be promptly made either with surgical approach or physical therapy or both as per the protocols.

MOVEMENT IS LIFE is a philosophical outlook of Jules Verne.

Even in healthy ageing of bones and skeletal system in general movement/ exercise/activity provides strength and definitely helps in graceful ageing of an individual and gives beauty to the process of ageing mind and body.

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