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شبكة المعلومات الجامعية التوثيق الالكتروني والميكروفيلم



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جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

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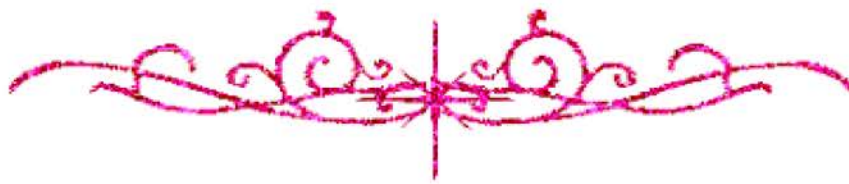
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BIYVEY

***INTERNAL FIXATION IN OSTEOPOROTIC
BONE***

An Essay

**Submitted for partial
Fulfillment of master degree
Of orthopaedic surgery**

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

"وَقُلْ أَعْمَلُوا فِيسِرِ اللَّهِ

عَمَلِكُمْ وَرِسُولِهِ وَالْمُؤْمِنُونَ"

صَلَّى اللَّهُ عَلَيْهِ وَسَلَّمَ

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Abbreviations

PTH: Parathyroid Hormone

BMD: Bone Mineral Density

IGF-1: Insulin-like Growth Factor- 1

WHO: World Health organization

SD: Standard Deviation

DEXA: Dual-Energy X-Ray Absorptiometry

NOF: National Osteoporosis Foundation

QCT: Quantitative Computed Tomography

RA: Radiographic Absorptiometry

QUS: Quantitative Ultrasound

DPA: Dual Photon Absorptiometry

SERM: Selective Estrogen-Receptor Modulators

HRT: Hormone Replacement Therapy

LCP: locked Compression Plate

DCP: Dynamic Compression Plate

PC-Fix: Point Contact Fixator

LISS: Less Invasive Stabilization System

PFN: Proximal Femoral Nail

DHS: Dynamic Hip Screw

PMMA: Polymethylmethacrylate

PHF: Proximal Humerus Fracture

CaP: Calcium phosphate

SRS: Skeletal Repair System

HA: Hydroxyapatite

VCFs: Vertebral Compression Fractures

PVP: Percutaneous vertebroplasty

OI :Osteogenesis Imperfecta

Introduction

Osteoporosis is a skeletal disorder characterized by low bone density and micro architectural deterioration of bony tissue leading to bone fragility and an increase in fracture risk. One in two women and one in four men aged 50 year and over will have osteoporosis related fracture in their life, (*Cooper C. et al.,2003*) Therefore, fractures are the most common problem associated with osteoporosis and despite advances in prevention and treatment of osteoporosis the number of fractures continue to increase. Along with the three classic locations hip, spine and wrist, there are several other fractures that relate to osteoporosis, (*Larsson S., 2002*)

As treatment of fractures in osteoporotic patient using conservative or conventional internal fixation methods leads to many problems that may appear intra or postoperatively, as implant loosening or implant cut-out so the internal fixation in a stable fashion is the main goal of treatment in osteoporotic bone in elderly . But achieving adequate fixation in osteoporotic bone is a challenge as the weak bone makes it difficult to achieve a stable bone-implant construct, (*Moroni A. et al., 2001*)

Fortunately, by development of dynamic load-sharing implants , less invasive techniques and development of materials that enhance the strength of the cancellous bone that surrounds the metal implant the results following fixation of osteoporotic fractures has been improved, (*Larsson S.,2002*)

Chapter 1

Essentials of Osteoporosis

1-Etiology and Types of Osteoporosis.

2-Pathogenesis of Osteoporosis

3-Histomorphology of Osteoporosis.

4-Biomechanics of Osteoporotic Bone.

Aim of the work

Fractures are the most common problem associated with osteoporosis and despite advances in prevention and treatment of osteoporosis the number of fractures continue to increase, the main goal of treatment of fractures in osteoporotic bone in elderly is to restore the patients to pre-traumatic status at the earliest possible time, and this can be achieved only through internal fixation. But the weak bone makes it difficult to achieve a stable bone-implant construct and general weakness of the patient often prevents reduction of load on the injured extremity during healing postoperatively. Consequently operative treatments of fractures in osteoporotic bone using standard techniques such as applied in normal bone leads to special problems. Therefore, the aim of the work is to discuss management of a patient with an osteoporotic fracture which can be divided into:

1. treatment of osteoporosis, 2. Reduction of falling incidence.
3. protection from fractures despite osteoporosis and falling (injury-site protection), and 4. Discussion of some new techniques of internal fixation that suite osteoporotic patients by achieving a stable bone-implant construct that reduce both intra and postoperative times and restore the patients to pre-traumatic status at the earliest possible time.

Osteoporosis:

Osteoporosis is defined as a systemic skeletal disease characterized by low bone mass and micro architectural deterioration of bone tissue with consequent increase of bone fragility and susceptibility to fracture (Fig. 1) , (*Cooper C.,2003*)

Etiology and Types of Osteoporosis:

Osteoporosis can be classified as primary or secondary, depending on the absence or presence of an associated medical condition known to cause bone loss.

A-Primary Osteoporosis

The term “primary osteoporosis” refers to the form of osteoporosis that is related to the normal phases of the human aging process, such as the bone loss that accompanies natural menopause or the normal aging process in all individuals, therefore there is three types of primary osteoporosis.

(1)Post menopausal osteoporosis (Type I).

Estrogen deficiency leads to increased bone resorption and rapid bone loss. Trabecular bone loss predominates over cortical bone loss this typically results in fractures of vertebral bodies and of the distal forearm.

(2) Senile osteoporosis (Type II).

Caused by age related bone loss that occurs in both sexes .There is less inequality between the rate of cortical and trabecular bone loss.

The typical manifestation is fracture of proximal femur in elderly people.

(3) Idiopathic osteoporosis.

Its onset is before 40 years and occurs in both sex with normal