CLINICAL AND RADIOGRAPHIC EVALUATION OF DENTAL IMPLANTS IN OSTEOPOROTIC PATIENTS

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بسم الله الرحمن الرحيم

((وعلمك ما لم تكن تعلم وكان فضل الله عليك عظيماً))

صدق الله العظيم

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(III) LIST OF ABBREVIATIONS

CT	Computed Tomography
DDR	Direct Digital Radiography
CCD	Wired charged-coupled device
PSP	Wireless storage phosphor screen
IP	Imaging plate
BMD	Bone Mineral Density
DEXA/ DXA	Dual-Energy X-ray Absorptiometry
WHO	World Health Organization
SD	Standard Deviation
BMC	Bone Mineral Content
QCT	Quantitative Computed Tomography
m GI/ GI	The Modified Gingival Index
PD	Probing depth
CBD	Crestal Bone Density
UR	Upper Right
UL	Upper Left
HA	Hydroxyapatite

Introduction

During the last 10 years, implant dentistry utilizing root-form implants has become a strong and rapidly growing clinical science. What was formerly considered an experimental solution to tooth loss has now become a predictable restorative alternative.

Healthy bone with normal regenerative capacity is imperative for success in all phases of dentistry. Bone is dynamic, and can be affected by local or systemic conditions. Normal bone metabolism is essentially crucial for success in implant treatment, as aberrations in bone physiology are likely to compromise the prognosis for optimal osseointegration[1].

Osteoporosis is a systemic condition with the potential for affecting implant treatment. The disease is particularly alarming because of its high incidence in the expanding older population, which contains the greatest number of candidates for implant therapy. Osteoporosis in other skeletal sites seems to be associated with a decrease of bone mineral density in the jaw[2].

There is a suggestion that patients with osteoporosis may have decreased alveolar bone height and greater tooth loss when compared with a normal population[3].
In addition, a majority of relevant studies suggest that postmenopausal osteoporosis may be important for the progression of bone loss in periodontitis[4].

This may reduce bone quantity at implantation sites. And therefore a question arises concerning implants in osteoporotic patients. That’s why this study was undertaken to throw light on the effect of osteoporosis on the success of dental implants.

Review of Literature

Dental Implants

The remarkable progress in implant dentistry over the past few decades helped to put the evidence into perspective. As recently as 1969, the successful anchorage of dental implants in dogs was still in the experimental stages[5].
These experiments were performed under remarkably modern antiseptic conditions un-imaginable prior to 1950, They also relied on the development of titanium and other high-technology alloys and bonds of incredibly sophisticated composition. These materials are necessary to provide a surface that can "fool" the human tissues into accepting them. The goal of modern implant research is to secure to the bone a permanently anchored unit that can be used for prosthesis attachment, this can take place when osseointegration has been achieved[6].

Only two decades ago, Brånemark's pioneering team presented the results of their long-term (10-year) studies of dental implants of all types and provided an important review of the literature[7].

Two years later, in 1979, Schnitman and Shulman edited a landmark volume discussing the benefits and risks involved in attempts to use the most modern of dental implants available[8].

The types of experimental materials that had been found to allow any success when used for implants multiplied after 1970, as had the special surfaces created for

these implants and the forms of the restorations[9]. The original titanium alloys that were successfully used were joined by implants using vitreous carbon, Vitallium, aluminum oxide, and various combinations coated with either carbon or titanium to enhance acceptance by the bone. These implant materials had paralleled incredible gain in bone joint replacement research. Despite considerable developmental success, by 1986 most researchers still had incomplete agreement regarding implant success[6].

Types of Dental Implants

Dental implants can be classified in many ways. The classification presented in this research aims primarily simplicity and is based upon their anchorage component as it relates to the alveolar bone which provides support and stability.

Accordingly, Dental implants can be classified into:

Mucosal inserts

A mucosal insert is "a metal insert attached to the tissue surface of a removable prosthesis that mechanically engages undercuts in a surgically prepared mucosal site"[10].

Figure (1): Titanium mucosal insert

Blade implants

Linkow in 1963 designed a self tapping implant called "Vent implant", but soon realized its limitations of use in areas of inadequate bone. He then altered the design of implants to overcome this problem and introduced the blade type implant in 1967 which was made of commercially pure titanium, a material he adopted from the work of PI Branemark, almost a decade earlier[12], Linkow then designed a multitude of configurations of the blade implant to fit almost any area of the jaws and meantime configuring to the anatomy of that area avoiding vital structures.
The blade vent implant proved to be a very successful and versatile implant and was the most widely used implant until the early 80's [13], especially in an era when it was theorized that fibro-osseointegration with its presumable resemblance to the periodontal ligament and shock absorbing characteristic was actually advantageous over bony-osseointegration. This theory was later proven to be pure myth[14].
A modification of Linkow's work was carried out by Roberts and Roberts in 1970 by introducing the ramus frame implant which engaged the bone by tripoding on the mental and ascending ramus areas[15].

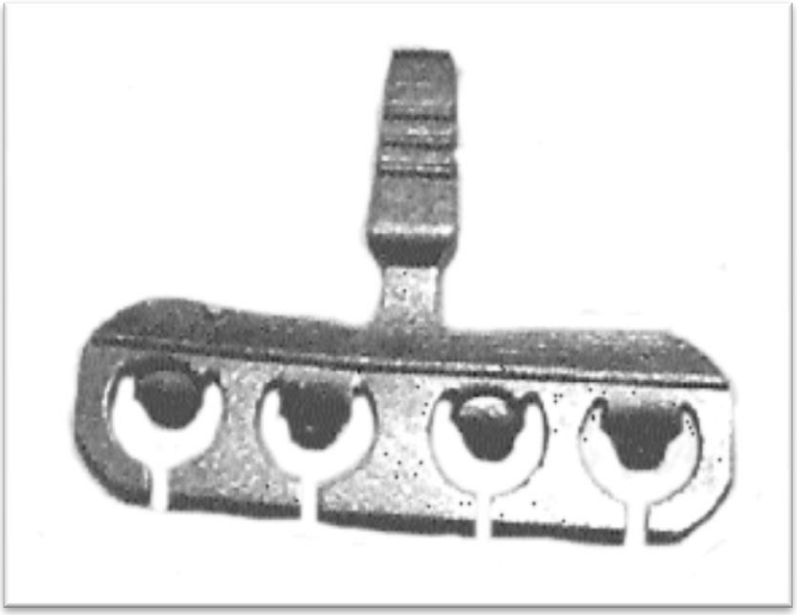

Figure (2): Blade implant