ORIGINAL ARTICLE

Bony Spurs on Femur: A Morphological Study of Dried Pakistani Femora

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ABSTRACT
Formation of new bone or bone spurs usually occur at two main sites: the joint margin (osteophytes) and ligament/ tendon insertions (enthesophytes) in degenerative joint disorders. Both osteophytes and enthesophytes are thought to be the skeletal responses to stress. An osteophyte is a bony spur that is formed as the lateral outgrowth of bone at the margin of the articular surface of a synovial joint. The osteophytes formation is an adaptive reaction as a result of joint instability commonly seen in degenerative disorders of joints. An enthesophyte is a bony spur formed at a ligament or tendon insertion into bone, and often develops in parallel with osteophytes at the periphery of articular cartilage.
Type of Study: Descriptive cross sectional study
Objectives: To find out the incidence of bony spurs on femora of Pakistani population
Materials and Methods: Present study was conducted on dried Pakistani femora in the Anatomy Departments of Allama Iqbal Medical College, Lahore and Khawaja Muhammad Safdar Medical College, Sialkot. For this purpose,177 dried adult femora were included. They were closely observed for the presence of bony spurs .
Results: Only 4 out of 177 femora showed presence of bony spurs. All of the four spurs were present on upper end of femur. Three were found on left femur and only one was present on right femur.The bones were photographed.This shows the incidence of 2.26%.
Conclusion: Finding of bony spurs on dried femora of Pakistani population contributes to the data of anatomical variations and to raise awareness about formation of osteophytes on femur which might play a role in diagnosis of degenerative joint disorders of hip joint. Osteophytes located on neck of femur may occur either as an early stage of hip osteoarthritis or for some independent reason

Key Words: Bony spurs, Osteophytes, Enthesophytes, Pakistani femora

INTRODUCTION
The formation of bone spurs usually occur at two main sites: the joint margin (osteophytosis) and ligament and tendon insertions (enthesophyte formation) in rheumatological disorders[1] . Osteophytes can be defined as lateral outgrowths of bone at the margin of the articular surface of a synovial joint. An enthesophyte is a bony spur forming at a ligament or tendon insertion into bone, growing in the direction of the natural pull of the ligament or tendon involved[2]. Osteophytes represent repair attempts , and therefore could serve to protect affected joints against the progression of destruction[3].Osteophyte formation closely resembles the process of chondrogenesis and endochondral bone formation as can be seen during embryogenesis[4] .There are three types of osteophytes: the traction spur, a physiologic kind of response at the tendons/ ligaments attachements ; the inflammatory spur, the syndesmophyte at the insertion of ligaments and tendons to bone as seen in ankylosing spondylitis; and the real osteophyte, arising in the synovium overlying bone at the junctional zone[5]. The mechanisms for osteophyte formation may involve responses to synovial membrane inflammation , general mechanical instability, and vascular metaplasia[6].

The osteophytes can be considered to be an adaptive reaction of the joint to cope with instability. Osteophytes splint the joint and may play a compensatory role in the redistribution of forces to provide articular cartilage protection[7]. However, osteophytes may represent a manifestation of aging in the absence of other bony changes. In most cases, they are asymptomatic, but they may be of clinical importance[8].

Enthesophytes are found at the attachments, or “entheses,” of tendons and ligaments . They appear as irregular outgrowths extending from the bone into the tendon or ligament and may develop in parallel with osteophytes at the periphery of articular cartilage . Bone spur formation may occur in response to increased levels of traction in the tendon. Endochondral, intramembranous and chondroidal ossification all contributed to spur formation and growth. Bony spur formation was a common age related phenomena and typically occurred in the most fibrous part of an enthesis[9]. Studies of skeletal remains have suggested that enthesophytes and osteophytes are both manifestations of an underlying "bone-forming" tendency[10]. A role for bone morphogenetic proteins in joint remodeling has been demonstrated in the formation of both enthesophytes and osteophytes[11]. Increased exercise could reactivate the growth process at the enthesis and lead to spur formation; spurs are often more common in athletically active people[12].

The synovial macrophage plays a pivotal role to mediate osteophyte formation , during experimental osteoarthritis[13]. Osteophytes can occur as a part of the aging process but are more commonly associated with osteoarthritis. Osteophyte formation is related to instability of osteoarthritic joints and their growth has been described as part of the attempt of a synovial joint to adapt to injury, limiting excess movement and helping to recreate a viable joint surface [14]. In osteoarthritis of hip joint, increased osteoarthritic cartilaginous changes were associated with increased subchondral enzyme activity, highest in the osteophytes and denuded weight bearing areas[15].

MATERIALS AND METHODS

This study was carried out to see incidence of bony spurs in femora of Pakistani population. 177 femora were analysed, irrespective of age and sex from the Anatomy Departments of Allama Iqbal Medical College, Lahore and Khawaja Muhammad Safdar Medical College, Sialkot. The femora included in this study were 81 of right side and 96 of left side. All the bones were closely observed for the presence of bony spurs.

RESULTS

Only 4 out of 177 femora showed presence of bony spurs. All of the four spurs were present on upper end of femur. Three were found on left femur and only one was present on right femur.The bones were photographed.The bones with spurs were numbered as F1,F2,F3 and F4.

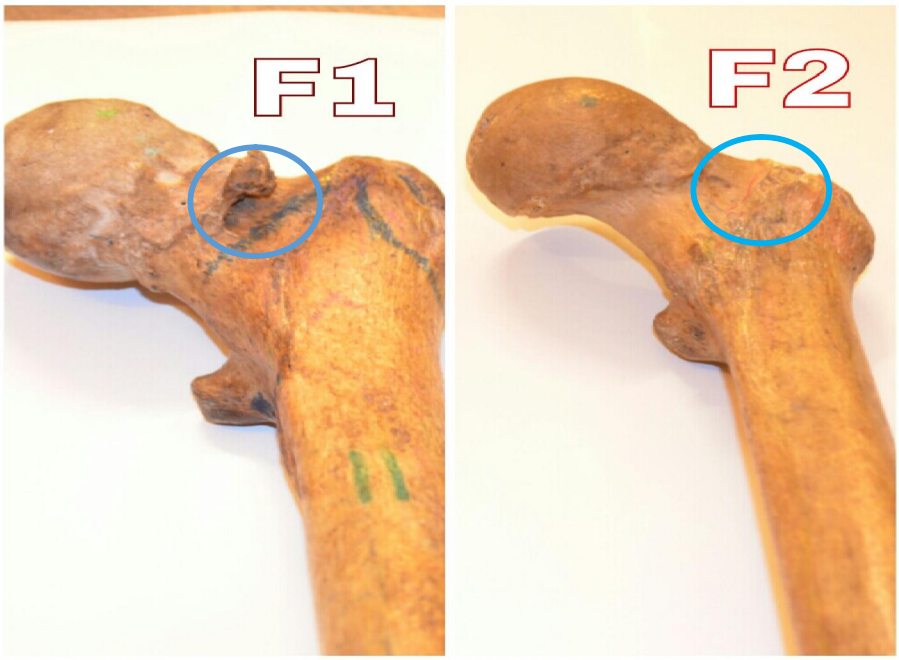

Fig 1: Showing F1 and F2
F1 shows bony spur on anterior aspect of neck of left femur .Head of femur is also distorted
F2 shows bony spur on anterior aspect of neck of left femur

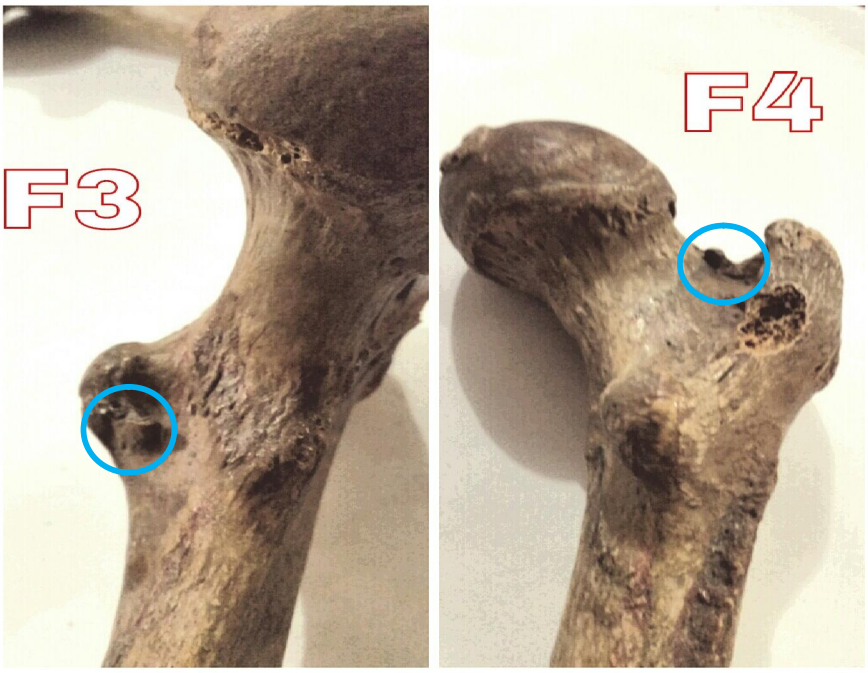

Fig 2: Showing F3 and F4
F3 shows a bony spur just inferior to lesser trochanter of left femur
F4 shows bony spur on posterior aspect of neck (medial to greater trochanter) of right femur

DISCUSSION

The commonest types of bony change seen in adult skeletons include osteophytes and enthesophyte formation. Present study shows the presence of bony spurs in 4 out of 177 femora in Pakistani population which shows incidence of 2.26%. In a study on osteophytes on femur, bony outgrowths were frequently noted on the femoral neck[16]. In another study by same author, osteophytes were seen in forty-eight specimens. These were invariably present peripherally at the junction of articular cartilage and synovium and less frequently at the attachment of the ligament of the femoral head. A constant finding in more advanced cases was a broad osteophyte applied to the medial aspect of the femoral head and lying adjacent to the fossa of the acetabulum. In additon to growing downwards, this broad osteophyte often extended upwards covering the original articular cartilage [17]. In a research, the appearance and frequency of the medial epiarticular osteophyte in human femoral heads were studied. Specimens were sampled from 24 men and 31 women who underwent total hip arthroplasty. On radiography, medial epiarticular osteophytes were present in two thirds of the cases[18] .

In a study multiple sites prone to either osteophyte or enthesophyte formation were examined in a large number of skeletons. Enthesophytes were observed at sites as the posterior spur of the calcaneum, the bicipital tuberosity of the radius, the greater trochanter of the femur, and the ischial tuberosity and enthesophyte formation was associated with increasing age and was more common in males than females[19].

A study shows the presence of femoral osteophytes in 108 cases out of 530 cases (20.4%).The prevalence of radiographic osteoarthritis would be increased in High Bone Mass population (HBM) , and that HBM may be associated with an excess of bone-forming features such as osteophytes and subchondral sclerosis[20].

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