The Aging Athlete

EVA LLOPIS and MARIO PADRÓN

27.1 Introduction

Our society has become fitness oriented; participation in sports has increased over recent decades. The benefits of exercises are extensive and many of physiological consequences of aging may be mitigated or reversed by regular exercise. The greatest threat to the health of the aging athlete is not the aging process itself but rather inactivity (Menard and Stanish 1989).

Box 27.1. Radiography

- Late stage imaging method for osteoarthrosis and not always correlation with pain
- Limited value in internal joint disease
- Not indicated for muscle, tendon disease
- Late imaging method for stress fractures, radiological pattern (linear sclerosis perpendicular to the major trabecular lines) and specific location (pubic rami, femoral neck, metatarsal bones) are the clues to the diagnosis. May be normal, inability to show sacral fractures

Box 27.2. Ultrasound

- Imaging guided percutaneous technique
- Excellent tool for assessing the superficial soft tissues, muscles and tendons
- Quick, cheap and available, but operator-dependent

Box 27.3. CT

- High radiation
- Indicated for stress fractures specially in sacrum
- Indicated in acute trauma

Box 27.4. MRI

- Excellent tool for assessing cartilage and joint, beware of asymptomatic findings with aging
- Early diagnosis for stress fractures
- Excellent tool for tendon and muscle evaluation
Aging athletes can be divided into those that wish to remain active as they age, weekend warriors and some of those who have never before exercised and practiced sports. Injuries may result from acute trauma (“macrotrauma”), insidious overuse injuries (“microtrauma”) or from a combination of these two mechanisms, although older athletes experience a lower incidence of acute traumatic injuries (Armsey and Hosey 2004; Chen et al. 2005). The risk of lesions are from their current programme and past indiscretions (Menard and Stanish 1989). Injuries of master-level practitioners reflect the impact of tissue aging (degenerative disease), repetitive joint stresses (chronic overuse injuries) or the long-term effects of athletic injuries (Bert and Gasser 2002; Wolf and Amendola 2005).

The aim of this chapter is to provide an overview of the different specific injuries that aging athletes can sustain, to help to differentiate “normal” from pathological aging, to identify radiological findings that are clearly associated with symptoms or disability and to provide some guidelines to help the practitioner respond more effectively to each individual patient (Table 27.1).

![image]

### 27.2 Impact of Osteoarthritis in Sport Activities: Risk and Consequences

Osteoarthritis is the progressive loss of normal cartilage structure and function, and involves all the joint tissues, bone, capsule, synovium and the cartilage (Wolf and Amendola 2005). The content and type of mucopolysaccharides in cartilage change in response to aging. This leads to a change in water content of the articular cartilage matrix, thus predisposing the cartilage to injury. There are multiple risk factors for osteoarthritis (OA), so determining whether an athlete’s OA is due to participation in sports or other factors is difficult. The joints that are particularly susceptible to OA in the general population are those involved in load bearing and a history of high sports participation increases the risk of osteoarthritis. The type of sport is an important factor in the subsequent risk of OA, with high-impact sports being more detrimental. Top athletes that competed in endurance (running, cross-country skiing), team (soccer, basketball, hockey) or power sports (boxing, wrestling, weightlifting) demonstrate an increase in hip and knee OA, with higher rates in team and power athletes (Fig. 27.1). For some sports such as running there is some controversy as to the role of exercise and the risk of OA; some authors found an increase in hip and knee OA in professional runners, but these data have not been confirmed by others. Among the throwing sports MRI revealed increased numbers of rotator cuff tears and acromio-clavicular OA in the dominant arm compared with the non-dominant limb. In addition, those athletes also displayed radiographic evidence of elbow OA. Increased hand OA has been found in rock climbers.

Chronic tendinosis is related to microtrauma to the tendons, and is therefore more frequent in the adult athlete population. Rotator cuff tendinosis, medial epicondylitis or wrist tendon tendinosis are common in golfers. Achilles tendinosis is the most common injury in joggers. Lateral epicondylitis is more common in middle age racquetball players (Chung and Kim 2003; Potter et al. 2004).

Furthermore, the effects of changes due to OA on different joints in the body have different implications for participants in different sports. Degenerative changes to any of lower extremity joints will be poorly-tolerated by those participating in running, cutting or pivoting sports, such as basketball, football, soccer, tennis and so on. OA in the shoulder, elbow, wrist or hands are likely to be well tolerated unless their sport involves some overhead activity. Overhead athletes such as tennis players, baseball players or swimmers would be far less tolerant to OA changes involving the upper extremity especially in the dominant arm.

The number of master female athletes has also increased. The majority of injuries sustained by female athletes are due to participation in the sport rather than their sex, but there are anatomic, hormonal, and functional differences between the sexes which must be considered (Ireland and Ott 2004).

Imaging of early cartilage damage evaluation is important for treatment options, focal disease have a different therapeutic approach than diffuse cartilage disease. MRI is a useful tool for the evaluation of subtle OA on cartilage-specific sequence due to its high soft tissue contrast. Although radiographs are a late stage imaging method and only provide an indirect evaluation, plain films remain the most widely available and least expensive imaging method. Joint space narrowing, subchondral sclerosis, subchondral cysts and osteophytes are classical OA imaging features. The absence of statistical correlation between the severity of the joint degeneration and the high prevalence of