

Osteoarthritis of the Hand

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INTRODUCTION

Osteoarthritis of the hand is a slowly progressive articular disorder. It occurs late in life and principally affects the load transmitting joints. It presents with pain, deformity and limitation of motion. It is characterised pathologically with focal erosive lesions, cartilage destruction, subchondral sclerosis, cyst formation and large marginal osteophytes. Radiological changes include narrowing of joint space, subchondral sclerosis, subchondral cysts and osteophytes.

Epidemiology

It occurs primarily in older adults. Radiographic studies show that osteoarthritis occur in more than 80% of adults older than 70 years old. It is more severe in females. The risk factors to develop osteoarthritis in hands are female gender, age and heredity. In the hand, joints commonly involved are the distal interphalangeal joint, carpo-metacarpal joint of the thumb and proximal interphalangeal joint. Osteoarthritis can be classified into primary and secondary. Primary osteoarthritis consists of Heberden's nodes, Bouchard's nodes, first carpometacarpal joint osteoarthritis and erosive inflammatory osteoarthritis in postmenopausal women. Secondary osteoarthritis develops as a result of trauma, avascular necrosis, inflammatory arthritis or calcium pyrophosphate dehydrate deposition.

Pathogenesis

The pathogenesis of primary osteoarthritis can be divided into 2 processes that occur simultaneously. Destruction: Abnormal physical stress causes change in cartilage surface and activation of the proteolytic enzymes. Abnormal cartilage surface will allow penetration of synovial fluid components including the enzyme hyaluronidase into the cartilage. The proteolytic enzymes cause destruction of the cartilage surface and increase degradation of the matrix components particularly the polysaccharides. The decrease in matrix components leads to loss of elasticity and the lubricating property and finally erosion of cartilage exposing the subchondral bone.

A vicious cycle develops as eroded cartilage when subject to normal physical stress will lead to the same pathophysiological reaction.

Repair: The cartilage attempts repair by chondrocyte proliferation and increase chondroitin synthesis.

CLINICAL FEATURES

The diagnosis of osteoarthritis in the hand is determined by clinical evaluation and radiological examination. Laboratory tests for primary osteoarthritis including sedimentation rate are normal.

Symptoms include joint pain that progresses from activity or work related to rest pain, weakness, loss of motion and deformity. These symptoms can affect the daily activities.

Physical examination consists of examining the painful joints for range of motion, deformity and instability. It also includes evaluation of hand function, grip and pinch strength. One should also look for associated conditions such as carpal tunnel syndrome and trigger finger.

For the distal interphalangeal joint, examination must be performed to look for Heberden's nodes and mucous cyst. For the proximal interphalangeal joint, look for Bouchard's nodes. For the trapezio-metacarpal joint, elicit the painful grind test, measure the pinch strength to demonstrate weakness in pinch and examine for subluxation, adduction deformity and secondary metacarpo-phalangeal joint hyperextension. The radiological classification advocated by Eaton is that: Stage 1: the articular contours are normal and the joint space widening is due to synovitis or ligament laxity; Stage 2: there is narrowing of carpo-metacarpal joint, minimal sclerotic changes and 2 mm osteophytes or loose bodies; Stage 3: carpo-metacarpal joint is markedly narrowed or subluxed and there are bigger than 2 mm osteophytes; Stage 4: there is pantrapezoidal disease.

TREATMENT

Most patients can be managed non-operatively with non-steroidal anti-inflammatory drugs, patient education and reassurance, hand therapy, splint, activity modification and occasionally steroid injections.

Surgery is indicated for persistent pain unresponsive to non-operative treatment or for deformity, instability or stiffness that impairs function.

Distal interphalangeal joint: Mucous cyst excision is indicated for pain, impending rupture and nail deformity. Debridement to remove painful osteophytes is indicated if the joint has preserved cartilage. Arthrodesis is reserved for joint with severe pain, marked deformity and instability. Proximal interphalangeal joint: Synovial cyst excision is indicated for pain and impending rupture. Arthrodesis is indicated in joints of the radial digits or joints with marked

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deformity or instability, poor bone stock or inadequate flexor or extensor mechanism. Arthroplasty is performed for joints of the ulnar 3 digits or joint with adequate bone stock, good alignment and intact extensor and flexor tendons. Complications of arthroplasty include failure to restore acceptable motion, instability with lateral deviation, implant fracture or silicone synovitis if silicon implants are used.

Trapezio-metacarpal joint: Total or partial trapezium resection with ligamentous reconstruction and tendon interposition is the most common procedure performed. Total or partial trapezium resection with silicone

interposition or cemented prosthesis is for low demand patients. Complications of implant interposition include dislocation, fragmentation, prosthesis deformity, adjacent carpal bone erosion and silicone synovitis. Arthrodesis is indicated for young patient with isolated trapezio-metacarpal joint disease. If there is associated metacarpo-phalangeal joint hyperextension, volar plate capsulodesis or tenodesis is performed if metacarphalangeal joint is preserved. Arthrodesis is recommended if the metacarpo-phalangeal joint is destroyed.

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