

Prevalence of Osteoarthritis of Wrist in Symptomatic Patients – A Tertiary Hospital Study.

Dr M.Vittaleswara Rao¹, Dr N.L.N.Moorthy², Dr S.Padmaja³,
Dr Harshini Reddy⁴, Dr T. Bhavishya⁵.

¹Assistant professor

²Professor

³Assistant professor

^{4,5}Senior Resident

Department of Radio Diagnosis

Apollo Medical College, Hyderabad 500096 Telangana India

Corresponding author: Dr NLN Moorthy

Abstract: Osteoarthritis of wrist is one of the most common problems encountered by the Orthopaedic surgeons in clinical practice. It results in prolonged functional disability. Majority of these are due to post traumatic sequel, the other causes being either metabolic or inflammatory joint disease or idiopathic. The present study is a retrospective analysis of the prevalence of various subtypes of osteoarthritis in symptomatic patients above 40 years who consulted the outpatient department in our institute.

Key Words: osteoarthritis - plain radiographs - wrist

Date of Submission: 18-04-2019

Date of acceptance: 04-05-2019

I. Introduction

Wrist osteoarthritis is a common clinical condition seen in OP department which develop mostly following trauma. The most common form of osteoarthritis is scapholunate advanced collapse (SLAC), followed by scaphoid nonunion advanced collapse (SNAC). The less common types include osteoarthritis of distal radio ulnar joint, osteoarthritis of carpometacarpal joint (CMC), osteoarthritis of scaphotrapezotrapezoid joint (STT), osteoarthritis of radiolunate, radioscapoid joint, and osteoarthritis of pisotriquetral joint. They clinically present with joint pains following active movement, limitation of joint mobility, morning stiffness and swelling of wrists. Following trauma to the wrist, there will be scapholunate ligamentous disruption resulting in intercarpal instability and early joint degeneration. Besides trauma the other causes of osteoarthritis include metabolic bone disease (CPPD) and idiopathic causes or avascular necrosis of carpals¹.

For treatment purpose post traumatic OA wrist is classified into 4 stages

Stage 1: The osteoarthritis is only localized in the distal scaphoid and radial styloid.

Stage 2: The osteoarthritis is localized in the entire radio scaphoid joint.

Stage 3: The osteoarthritis is localized in the entire radioscapoid joint with involvement of capitulum joint.

Stage 4: The osteoarthritis is localized in the radiocarpal joint and in the intercarpal joints. It also involves distal radioulnar joint.

The diagnosis of wrist osteoarthritis is done mostly by plain radiographs only and CT scan is rarely required. Though the standard views for wrist radiography are postero anterior and lateral projections, additional views like oblique view, anteroposterior view and radiocarpal joint views are applied for better anatomical delineation of carpal bones.²

II. Case Details

A detailed retrospective study of the standard wrist radiographs of 340 patients with symptoms of arthritis of wrist was taken up in a period of one year. The most common symptom was pain and tenderness of wrist followed by joint stiffness. All radiographs were evaluated for the evidence of osteoarthritis and staged the extent of the disease by following the standard protocol described.³

Stage 1: narrowing of joint space in comparison with other intercarpal joints in the same radiograph.

Stage 2: narrowing of joint space with or without periosteal sclerosis and one or both, cystic like lucencies or osteophytes.

Stage 3: complete narrowing of joint space.

Out of the 340 patients referred for wrist radiographs with clinical features of osteoarthritis 204 patients (60 %) showed certain degree of osteo arthritic changes in different intercarpal joints. In the remaining cases the changes were due to rheumatoid arthritis , metabolic bone disease and united fractures and other causes which was not included in the study. The most common type of wrist osteoarthritis observed in our study was thumb carpometacarpal joint OA followed by scaphotrapeziotrapezoidal OA. The incidence of different types of OA was given below.

Table 1: Incidence of various types of OA in wrist : N =204

	N (N=204)	% (N =204)
Thumb CMC	64	31.3
Scaphotrapeziotrapezoidal OA	54	26.4
Scapholunate advanced collapse	45	22.0
Distal radioulnar joint arthritis	24	11.7
Scaphoid nonunion advanced collapse	10	4.9
Radioscaphoid and radiolunate arthritis	4	1.9

All subtypes of osteoarthritis were further grouped into 3 stages depending on the radiographic findings .

Table 2: Incidence of different stages of thumb CMC joint OA N= 64 %

	N= 64	%
Stage 1	35	54
Stage 2	15	23
Stage 3	14	21

Table 3: Incidence of different stages of STT OA changes N=54 %

	N=54	%
Stage 1	29	53
Stage 2	10	18
Stage 3	15	25

Table 4: Incidence of different stages of SLAC N= 45 %

	N= 45	%
Stage 1	20	44
Stage 2	15	33
Stage 3	10	22

III. Discussion

The degenerative changes in the joints are generally classified into four stages based on radiographic findings (Eaton staging system).⁴

Stage 1: Normal articular cartilage with mild joint space narrowing.

Stage 2: Narrowing of joint space with subchondral sclerosis , osteophyte formation < 2mm

Stage 3: Significant joint space narrowing with cystic changes and sclerosis, osteophyte formation > 2mm

Stage 4: Advanced degenerative changes.

Scapholunate advanced collapse (SLAC) : (FIG 1 A-D)

Is the most common type of osteoarthritis involving wrist ⁵.The patients present with swelling , pain with tenderness in the periscaphoid region. Besides trauma to the scapholunate ligament , the other causes of SLAC include avascular necrosis of scaphoid , perilunate dislocation CPPD crystal deposition disease. It is divided into 4 stages.

Stage : OA is localized in the distal scaphoid and radial styloid.

Stage 2: OA localized in the entire radio scaphoid joint.

Stage 3: OA localized in entire radio scaphoid joint with involvement of capitulate joint.

Stage 4: OA located in entire radiocarpal joint , intercarpal joints. also involve distal radio ulnar joint. Though described as the most common type of OA wrist , we found that only 22 % cases showed the lesions in our study of which stage 1 was the most commonly seen.

Scaphoid non union advanced collapse (SNAC): (Fig 2 A-C)

In this type the primary lesion is due to fracture and non union involving scaphoid with the ligament being intact. It is graded into 3 stages.

Stage 1: Arthritis involving distal scaphoid and radial styloid .

Stage 2: Radioscaphoid and scaphocapitate arthritis.

Stage 3: Lunocapitate arthritis. In our study 10 patients have shown various stages of SNAC lesions of which the stage 1 was the most common type .

Osteoarthritis of carpometacarpal joint: (CMC arthritis): Fig 3 A-D

Is one of the most common osteoarthritis that affects the hand, seen mostly in post menopausal women. Many factors including genetic and hormonal causes have been implicated in the development of CMC arthritis in women. The Grind test is considered highly specific (80-93 %) to diagnose CMC arthritis clinically.⁶ Based on radiographic findings CMC arthritis is grouped into 4 stages (Eaten staging system).

Stage 1: Mild narrowing of joint space

Stage 2: Joint space narrowing with subchondral sclerosis and osteophytes < 2mm.

Stage 3: Significant joint space narrowing ,osteophyte > 2mm

Stage 4: Advanced OA changes with scaphotrapeziotrapezoidal joint destruction.

CMC arthritis is the most frequently affected joint in our study involving 64 out of 204 patients (31.3 %).

Scaphotrapeziotrapezoid arthritis (STT arthritis): Fig 4 A-C

Is the second most common osteoarthritis of the wrist. It is more common in women above 50 years. It is usually associated with CMC arthritis in view of close proximity of the joint. The etiology can be due to trauma, under development of capitato-trapezium ligament, altered morphology of lunate etc. it is staged into 3 groups.

Stage 1: joint space narrowing

Stage 2: joint space narrowing with osteophyte or cyst formation.

Stage 3: complete collapse of joint. In the present study STT arthritis is seen in 54 out of 204 patients (26.4 %).

Ronit and others found that STT arthritis is the most common type of arthritis in their study of the wrist radiographs but it is not clinically correlating with symptoms .

Osteoarthritis of distal radioulnar joint (DRUJ): Fig 5.

Is seen most frequently following trauma to wrist or forearm or due to disruption of triangular fibro cartilage complex. 24 out of 204 patients have shown DRUJ arthritis in our study.

Osteoarthritis of radiolunate and radioscaphoid joint :

Results from either trauma , inflammation or avascular necrosis .

a) Kienbock disease (avascular necrosis of lunate) : is graded into 3 stages based on Radiographs

Stage 1: mild pain with normal radiographs, early OA changes on MRI

Stage 2: increased lunate density

Stage 3: A) lunate collapse without scapholunate Instability

Stage 3 B) lunate collapse with scapholunate instability

Stage 4:pancarpal arthrosis.⁷

b) Preiser' disease (avascular necrosis of scaphoid) is extremely rare.

c) Post distal radius fracture .

In our study we encountered only 4 cases of radioscaphoid and radiolunate arthritis .

Andrew et al ⁸ reviewed 1007 wrist radiographs and found that radio and mid carpal osteoarthritis is more prevalent than SLAC pattern and the incidence of OA is more frequent in males with increasing age. The treatment of these cases will be conservative with analgesics in many cases. The various surgical techniques described include radial styloidectomy with scapholunate reduction and stabilization, four corner fusion, proximal row corpectomy and wrist arthrodesis depending on the stage of the disease.⁹

wrist osteoarthritis is a very significant public health issue in the elderly and the aim of management is to reduce pain and prevent functional impairment.

IV. Conclusions

Plain radiographs are more than sufficient for diagnosis and staging of the different types of osteoarthritis so that early and appropriate treatment can be provided to the patients .

References

- [1]. Krista E.Weiss, Craig M.Rodner MD Osteoarthritis of wrist *The Journal of Hand Surgery* vol32 A .NO 5 may-june 2007
- [2]. Anil K.Bhat ,Bhaskaranand kumar, Ashwath Acharya Radiographic imaging of the wrist *Indian J Plastic Surg* 2011 may-aug: 44 (2) : 186-196
- [3]. Ronit Wollestein, Julio Clavijo, Louis A.Gilula Osteoarthritis of the wrist STT Joint and Radiocarpal joint *Hindawi publishing corporation : arthritis* 2012 article ID 242159.
- [4]. Nimit Patel ,Glenn Russo, Craig Rodner in Chap. Osteoarthritis of the wrist in *Osteoarthritis –diagnosis,treatment and surgery* 2012 *Intechopen*
- [5]. Watson, H. K. and J. Weinzweig (1999). "Triquetral impingement ligament tear (tilt)." *Journal of hand surgery* 24(3): 321-324.
- [6]. Merritt, M. M., T. S. Roddey, et al. (2010). "Diagnostic value of clinical grind test for carpometacarpal osteoarthritis of the thumb." *Journal of hand therapy : official journal of the American Society of Hand Therapists* 23(3): 261-267; quiz 268.
- [7]. Saunders, B. M. and D. Lich tman (2011). "A classification-based treatment algorithm for Kienbock disease: current and future considerations." *Techniques in hand & upper extremity surgery* 15(1): 38-40.
- [8]. Andrew Miller, Kevin F.Lutsky, Jonathan Shearin, Matthew Cantlon, Scott Wolfe, Pedro K.Beredjiklian. Radiographic patterns of radiocarpal and midcapal arthritis *JAAOS Glob Res Rev* 2017 ; 1 : 017
- [9]. J.Laulan, E.Marteau. G.Bacle Wrist osteoarthritis *Orthopaedics & Traumatology : surgery & research* 101(2015) S1-S9



Fig 1 SLAC A) Stage 1



B) Stage 2



C) Stage 3



D) Stage 4



Fig 2. SNAC A) Stage 1



B) Stage 2



C) Stage 3



Fig 3) CMC A) Stage 1



B) Stage 2



C) Stage 3



D) Stage 4



Fig 4 STT A) Stage 1



B) Stage 2



C) Stage 3

Fig 5: Distal radioulnar arthritis



LEGENDS :

Fig 1 (A-D) : SCAPHOLUNATE ADVANCED COLLAPSE Stage 1-4

Fig 2 (A-C) : SCAPHOID NONUNION ADVANCED COLLAPSE Stage 1-3

Fig 3 (A-D) : CARPOMETACARPAL JOINT ARTHRITIS Stage 1-4

Fig 4 (A-C) : SCAPHOTRAPEZIOTRAPEZOID JOINT ARTHRITIS stage 1-3

Fig 5: DISTAL RADIOULNAR JOINT ARTHRITIS

Dr NLN Moorthy . “Prevalence of Osteoarthritis of Wrist in Symptomatic Patients – A Tertiary Hospital Study.” IOSR Journal of Dental and Medical Sciences (IOSR-JDMS), vol. 18, no. 04, 2019, pp 53-63.