

Original Research Article

To describe typical sonographic appearance of lesion in wrist pain patient and detect pathology that are not possible with wrist x ray

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Abstract:

Background & Method: The aim of present study is to describe typical sonographic appearance of lesion in wrist pain patient and detect pathology possible with wrist x ray. All patients with wrist joint pain examined by the orthopedic opd & ipd and referred to the dept. of radio-diagnosis. A pre-informed written consent is taken from the patient, which is attached to a questionnaire which include the patient's history, general physical examination and detailed wrist joint examination.

Result: Cross sectional statistical analysis of X -ray findings of study subjects based on numbers and percentages, reveal that 91% of subjects had normal findings and rest 9% had abnormal findings. Cross sectional statistical analysis of ultrasound findings tendons of study subjects based on numbers and percentages, reveal that 27subjects had abnormal findings, among which 12 subjects had De Quervain's tenosynovitis, 7 subjects had flexor tenosynovitis, 8 subjects had extensor tenosynovitis.

Conclusion: 100 Patients with wrist pain, associated symptoms include swelling 31 (31%), numbness 4 (4%), restriction of movements 3(3%). In 100 patients, 48 /100 (48%) had pain of more than 3 month duration. 100 patients with wrist pain, associated symptoms include swelling 31 (31%), numbness 4 (4%), restriction of movements 3(3%). In 100 patients, 48 /100 (48%) had pain of more than 3 month duration. The commonest pathology causing wrist pain is focal cystic masses which can be simple or infected followed by tendon pathologies like tenosynovitis commonly De Quervain's tenosynovitis.

Keywords: sonographic, lesion, wrist pain and pathology & x ray.

Study Designed: Cross sectional observational study.

1. INTRODUCTION

Ultrasound (US) is an imaging technology that uses high-frequency sound waves to characterize tissue. It is a useful and flexible modality in medical imaging, and often provides an additional or unique characterization of tissues, compared with other modalities such as conventional radiography or CT.

Ultrasonography is an imaging modality that uses sound waves in the higher frequency range (>20 Kilo Hertz) which normally cannot be heard by human beings. Audible sounds are in the range of 30 Hertz (Hz) - 20000 Hz frequency range. Ultrasound travels as a longitudinal wave, and images are generated when pulses of ultrasound from the transducer produce echoes at tissue or organ boundaries¹.

Diagnostic ultrasound applications use frequencies in the 1 MHz (Mega Hertz) – 30(Mega Hertz) frequency range. Clinical musculoskeletal (MSK) ultrasound needs as high frequency as practical that can still allow adequate visualization depth into tissues. Higher frequencies are associated with improved spatial detail or better resolution².

The use of ultrasound in musculoskeletal system started in 1958 where it was used to describe the articular and periarticular structures such as muscles, tendons, cartilage and bone. The earliest diagnostic application of ultrasound in musculoskeletal disease was published in 1972 in the British Journal of Radiology, where the authors used ultrasound to differentiate Baker's cysts from thrombophlebitis. In 1978, ultrasound technology started to be used to demonstrate synovitis in rheumatoid arthritis patients. The applications of ultrasound in musculoskeletal conditions have continued to expand and this imaging modality is gaining increasing acceptance as a valuable diagnostic tool³.

Like most sub disciplines in diagnostic imaging, musculoskeletal radiology has been affected by the explosive technological developments that have taken place during the last few decades. But the order of testing should be (1) from inexpensive to costly, (2) from less to more risky, (3) from simple to more complex. Unfortunately, despite the dramatic advances in CT and MR imaging, they do carry a high expense and they are performed at fixed facilities⁴. Thus, the ideal initial imaging device, after plain radiograph is ultrasound because it provides economical and non-invasive imaging of tissue. Significant advances in gray-scale and color flow ultrasound imaging have resulted in an expanded role of US in the evaluation of musculoskeletal pathology⁵.

2. MATERIAL & METHOD

All the patient with wrist pain who referred to the Department of Radio diagnosis, IMCH&RC Indore for diagnosis and evaluation subjected to high resolution ultrasound of wrist. A study performed in Ages >25 yrs and both sexes included in the study .it is duration based study the study done for duration for February 2019 to August 2020.

All patients with wrist joint pain examined by the orthopedic opd & ipd and referred to the dept. of radio-diagnosis. A pre-informed written consent is taken from the patient, which is attached to a questionnaire which include the patient's history, general physical examination and detailed wrist joint examination.

INCLUSION CRITERIA –

1. All cases of non-traumatic wrist pain referred from Orthopaedic department of IMCH&RC Indore and then presenting to Radio diagnosis, IMCH&RC Indore.

EXCLUSION CRITERIA -

1. Trauma
2. Age group <25 yrs.
3. Not given consent

4. RESULTS

Table 1: Age wise distribution of study subjects

Age (Years)	Frequency	Percent
25-34	42	42
35-44	20	20
45-54	19	19
> 55	19	19
Total	100	100

Cross sectional statistical analysis based on number and percentage, it reveals that 42% of the subjects were between 25-34 years, 22% of subjects were between 35-44 years, 19% of subjects were between 45-54 years and rest 19% of the subjects were above 55 years of age.

Table 2: Distribution of study subjects based on Chief complaints

Category	Frequency	Percent
Pain	100	100
Swelling	31	31
Numbness	4	4
Restriction of Movements	3	3

Cross sectional statistical analysis of chief complaints of study subjects is done based on numbers and percentages. It shows 100% of subjects were having pain, 31% of subjects were having swelling, 4% of subjects having numbness of fingers and 3% were having restriction of movements of wrist. Majority of the subjects were having more than one symptom.

Table 3: Distribution of study subjects based on affected wrist

Limb	Frequency	Percent
Right	52	52
Left	48	48
Total	100	100

Table 4: X-ray findings

Abnormal	9	9
Normal	91	91
Total	100	100

Cross sectional statistical analysis of X -ray findings of study subjects based on numbers and percentages, reveal that 91% of subjects had normal findings and rest 9% had abnormal findings.

Table 5: Ultrasound examination-Tendon

Findings	Frequency	Percent
De Quervain's	12	44.44
TENOSYNOVITIS		
Flexor	7	25.92
Extensor	8	29.62
Tendon tear	0	0
Tendon rupture	0	0
Total	27	100

Cross sectional statistical analysis of ultrasound findings tendons of study subjects based on numbers and percentages, reveal that 27 subjects had abnormal findings, among which 12 subjects had De Quervain's tenosynovitis, 7 subjects had flexor tenosynovitis, 8 subjects had extensor tenosynovitis.

5. DISCUSSION

A provisional diagnosis was suggested after the USG and X-ray examination in the present study, A Clinico-radiological correlation of wrist joint pain was done in selected patients with wrist joint pain attending the orthopaedic outpatient department in Index Medical College Hospital and Research Centre Indore.

The age distribution of the study subjects, Many of the patients (42%) were under 34 years of age. 20% of patients were between 34-44 years and another 19% of patients were between 45-54 years. Only 19% of the subjects were above 55 years⁶.

The age distribution of the study subjects, many of the patients (42%) were under 34 years of age. 20% of patients were between 34-44 years and another 19% of patients were between 45-54 years⁷. Only 19% of the subjects were above 55 years.

The distribution of the affected wrist in the study subjects. Right wrist (52%) is slightly higher than the left wrist (48%) and does not have much significance⁸. X-ray examination findings were of subjects showed normal X-ray findings and only 9% of subjects had abnormal findings.

Ultrasound examination findings were Ultrasound findings of tendons of the wrist joint. Out of the total 100 subjects, 27 subjects were found to be having abnormal findings in tendons. All subject had tenosynovitis⁹. De Quervain's tenosynovitis was seen in 12 subjects (44.44%) and flexor tenosynovitis was seen in 7 subjects (25.92%) and extensor tenosynovitis (29.62%) were seen in 8 subjects¹⁰.

6. CONCLUSION

100 Patients with wrist pain, associated symptoms include swelling 31 (31%), numbness 4 (4%), restriction of movements 3(3%). In 100 patients, 48 /100 (48%) had pain of more than 3 month duration. 100 patients with wrist pain, associated symptoms include swelling 31 (31%), numbness 4 (4%), restriction of movements 3(3%). In 100 patients, 48 /100 (48%) had pain of more than 3 month duration. The commonest pathology causing wrist pain is focal cystic masses which can be simple or infected followed by tendon pathologies like tenosynovitis commonly De Quervain's tenosynovitis.

7. REFERENCES

1. Lew HL, Chen CP, Wang TG, Chew KT. Introduction to musculoskeletal diagnostic ultrasound: examination of the upper limb. *Am J Phys Med Rehabil*. United States 2007; 310-321.
2. Zagzebski J.A; Physics and instrumentation in Doppler and B-modeultrasonography. In: Zweibel W.J, Pellerito J,editors. *Introduction to Vascularultrasonography*.5th Ed. WB Saunders Co 2004;19-60.
3. Taylor. M, Shamma.R. Musculoskeletal ultrasound: General principles and applications in Rheumatology. *Clinical commentary, Proceedings of UCLA Healthcare* 2008; 8:1-5.
4. Sharma UK, Shrestha D. Musculoskeletal ultrasound: is it underutilised? *Kathmandu University Medical Journal* 2007; 5:4(20):552-556.

5. Nazarian LN. The top 10 reasons musculoskeletal sonography is an important complementary or alternative technique to MRI. *AJR Am J Roentgenol.* United States 2008; 1621-1626.
6. Bajaj S, Pattamapaspong N, Middleton W, Teefey S. Ultrasound of the Hand and Wrist. *Journal of Hand Surgery* 2009; 759-60.
7. Rowe. L.J, Yochum.T.R; Principles of Radiologic interpretation. In: Rowe.L.J, Yochum.T.R, editors.Essentials of Skeletal Radiology. 3rd Ed. LipincottWilliams and Wilkins; 2005: 680-719.
8. Johnson. D, Ellis. H, Collins. P. Pectoral Girdle and Upper limb. In: Standring. S. Editors. Gray's anatomy The anatomical basis of Clinical Practice. 39th Ed. Churchill Livingstone Elsevier.2004; 801-933.
9. Lowden CM, Attiah M, Garvin G, MacDermid JC, Osman S, Faber KJ. The prevalence of wrist ganglia in an asymptomatic population: magnetic resonance evaluation. *Journal of Hand Surgery.*2005; 302-306.
10. Wong Dc Fau - Wansaicheong GK, Wansaicheong Gk Fau - Tsou IY, TsouIY. Ultrasonography of the hand and wrist. *Singapore Med J* 2009; 50(2): 219-226.