



DIAGNOSING NON OSSEOUS CAUSES OF WRIST PAIN- ROLE OF HIGH RESOLUTION ULTRASONOGRAPHY

Radiology

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ABSTRACT

Being a fast, less expensive, real time dynamic study, high resolution ultrasonography has provided a better option for diagnosing soft tissue pathologies in painful wrist joint. **Purpose-** Diagnosing the cause of painful wrist joint is a challenge for physicians especially in soft tissue pathologies, ultrasound imaging can provide an early, real time and efficient diagnosis and help in planning of treatment accordingly whether conservative or surgical approach is needed. So this shortens the course of treatment. **Materials and methods-** A hospital based descriptive study done in department of radiodiagnosis SMS hospital Jaipur. Patients with history of both traumatic and non traumatic wrist pain were selected, prior X-ray was done. Total 45 patients were scanned using high frequency linear transducer (7-10 MHz) and hockey stick transducer on canon Aplio700 machine. Diagnosis was confirmed by MRI and clinical course of patient. The data were compiled and analyzed. **Results-** In our study of 40 patients, USG detected 2 patients with foreign body, 5 with tendon rupture/ dislocation, 18 with tendonitis and tenosynovitis, 12 with ganglion cyst, 4 with soft tissue mass lesion/ collection, 4 with nerve pathology, 1 with scapholunate ligament injury, 1 with TFCC tear 1 with capsule rupture as a cause of wrist pain. **Conclusion-** Ultrasound provides a quick, accurate and inexpensive diagnosis in soft tissue pathologies of wrist, foreign bodies, tendon pathologies.

KEYWORDS

Wrist joint, High resolution ultrasonography, soft tissue pathologies.

INTRODUCTION -

The wrist is one of the most complicated joint in the body and the most important joint for today's human being in this computer and internet age. Pain is common presenting symptom of wrist pathology. It is not surprising that the painful wrist presents the physician with a diagnostic challenge.⁽¹⁻²⁾ Wrist pain is traditionally classified as acute pain caused by a specific injury or as subacute/chronic pain that usually develop gradually with or without a prior traumatic event. In these cases, there is a wide range of differential diagnosis which includes tendinopathy, tendonitis, tenosynovitis, arthritis, and ganglions⁽³⁻⁴⁾ USG provides a reliable diagnosis regarding cystic or solid nature of lesions and can help in diagnosis based on their imaging patterns^(5,6) USG allows dynamic tendon examination which gives it a distinct advantage over MRI. Ultrasound imaging can provide an early, real time and efficient diagnosis and help in planning of treatment accordingly whether conservative or surgical approach is needed. So this shortens the course of treatment.

MATERIALS AND METHODS-

A descriptive study was performed on out-patient and in-patient of orthopedics and general medicine (Rheumatology) departments through which cases are sent to Department of Radiodiagnosis, SMS Hospital, Jaipur, Rajasthan. Total 40 patients of wrist pain were examined in this study. Patients were scanned using high frequency linear transducer (7-10 MHz) and hockey stick transducer on canon Aplio a machine. Prior to USG examination X-ray of wrist was done for diagnostic supplementation. Diagnosis was confirmed by MRI and clinical course of patient. The data were compiled and analyzed.

RESULTS-

Our study included 40 patients of wrist pain with suspected non osseous pathology. Out of 40 patients, 28 (70%) didn't had any history of trauma and 12 (30%) had history of trauma.

Age and sex distribution of patients-

Out of 40 patients, 25 (62.7%) were male and 15 (37.5%) were female. 11 patients belonged to 21-30 year age group, 10 to 31-40 years, 10 to 41-50 years, 8 to 51-60 years and 1 patient belonged to 61-70 years age group.

Foreign body-

In our study of 40 patients, USG detected 2 patients with foreign body. Findings were similar on MRI and postoperatively.

Tendon rupture/ dislocation-

Out of 40 patients, 5 were detected with tendon rupture or dislocation. Similar findings were confirmed on MRI.

Tendonitis and tenosynovitis- 18 patients were detected with tendinitis and tenosynovitis.

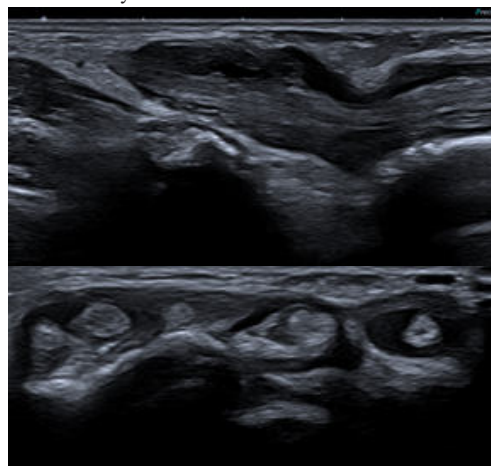


Fig 1- USG showing tenosynovitis and tendinitis of extensor tendons

Ganglion cyst- 12 patients had ganglion cyst on USG.

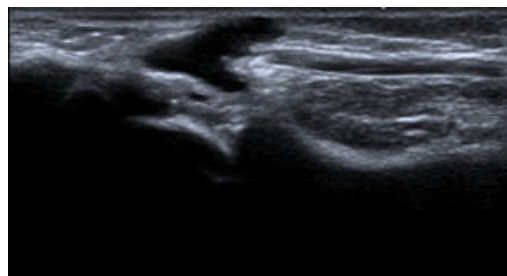


Fig 2- Hypochoic ganglion cyst in extensor compartment of wrist.

Soft tissue mass lesion/ collection-

There were 4 patients with soft tissue mass lesion/ collection.

Nerve pathology-

4 patients had median nerve thickening on USG.

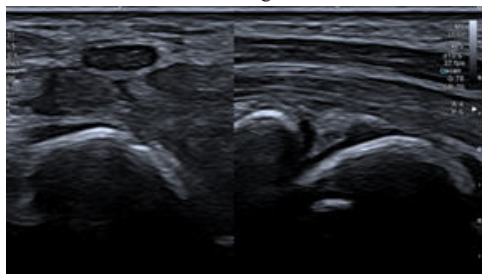


Fig 3- USG showing hypoechoic, flattened median nerve in carpal tunnel causing carpal tunnel syndrome.

Capsule rupture-

1 patient had capsule rupture with history of trauma.

1 patient of TFCC tear and 1 patient of scapholunate ligament rupture was diagnosed on USG however many patients with these pathologies were missed on USG and confirmed on MRI when clinical suspicion persisted.

PATHOLOGY	NO. OF PATIENTS	PERCENTAGE
Tenosynovitis	18	45
Ganglion cyst	12	30
Foreign body	2	5
Ruptured tendon / dislocated	5	12.5
Nerve pathology	4	10
Soft tissue pathology/ collection	4	10
TFCC tear	1	2.5
Scapholunate ligament rupture	1	2.5
Capsule rupture	1	2.5

DISCUSSION-

- The use of ultrasound has been described in the diagnosis of a wide range of soft tissue conditions involving the wrist. Ultrasound is faster and better tolerated, provides images of higher spatial resolution, is presently unique in its ability to evaluate soft tissue dynamics in real time, and would be preferred to MRI if shown to have equivalent or greater diagnostic efficacy at lower cost.
- Most common pathology among patients of wrist pain in our study was tenosynovitis in 45% patients. Similar results were found in study by El Deek et al.³
- Ganglion cysts were found in 30% patients.
- In our study, an ultrasound finding of FB, tendon rupture, tendinitis, peritendinitis, or ganglion was diagnostic. These results were in agreement with the study by K. Singh et al.⁵ However, in each of these settings, there was also a small false negative rate. A "normal" ultrasound report was therefore not as reliable, and in this situation there is a need to carefully correlate negative test results with the clinical context. If a strong clinical suspicion persists, further investigation is warranted.
- In cases of TFCC and scapholunate ligament injury, USG missed multiple cases which were diagnosed on MRI later. These results were in agreement with study by El Deek et al.³
- Ultrasound could be used variously to clarify diagnosis, to monitor disease course or treatment response, to objectively document the presence of disease in work-related cases by comparison with the normal side, or to assist with preoperative planning.
- Specifically, we suggest the following indications for ultrasound: 1. The diagnosis and localization of FB when conventional x-ray is negative. 2. The diagnosis of tendon rupture and level of rupture) versus tendon adhesion. 3. The diagnosis of clinically equivocal tendinitis and peritendinitis. 4. The diagnosis of occult ganglion (ultrasound being more accurate and cost-effective than MRI). 5. The assessment of ganglion extent and likely site of ganglion origin (whether palpable or occult) in cases considered for open surgery.

CONCLUSIONS-

- Although ultrasound is operator dependent and the accuracy of its result depends on the experience of the operator, USG technology offers several inherent advantages; being noninvasive, fast, less expensive, and without radiation makes it well accepted by

patients.

- It should be the first choice of investigation for the majority of the cystic, tendinous, vascular, and fibrotic pathologies of the wrist.
- For when diagnosis of ligamentous pathologies is suspected clinically, or if suspicion of wrist pathology persists even after negative ultrasonography, patient should undergo further examination with MRI or MR arthrography to find out underlying pathology.

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