

Dorsal wrist impingement syndrome, arthroscopic findings and results of arthroscopic treatment: a short term results

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Introduction

Dorsal wrist impingement syndrome is a clinical syndrome of dorso radial wrist pain especially with extension. Arthroscopic findings may include a patulous capsule, synovial hypertrophy or ganglion. Arthroscopic treatment involves debridement with resection of part of the capsule. Short term results are outlined for a cohort of patients.

Patients and methods

A total of 20 patients, 12 males and eight females. Mean age is 27 years. The right side was involved in 16 patients and left side in four patients. Dominant side was involved in 16 patients. Seven patients had apparent dorsal wrist ganglion, while five patients had occult ganglion diagnosed by MRI.

Results

At the end of follow-up at a median time of 6 months after surgery (range, 4–10 months), the mean visual analog scale score improved from 5.9 preoperatively to 2 postoperatively. Mean quick Disabilities of the Arm, Shoulder, and Hand improved from 49.1 to 4.8. Mean strength improved from 28.1 to 33.1 kg. range of motion did not differ significantly between pre and postoperative.

Conclusion

Wrist arthroscopy is a valuable tool for diagnosing and treating dorsal wrist impingement syndrome.

Keywords:

arthroscopy, capsule, dorsal wrist, impingement

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Introduction

Dorsal wrist impingement syndrome is a clinical syndrome characterized by chronic dorsal-radial wrist pain just distal to Lister's tubercle, especially, with activities requiring wrist extension like push up from a chair. The etiology is unclear; however, a traumatic event or repetitive overuse may be a possible mechanism [1].

The condition has been first described by Watson *et al.* They considered the condition as a predynamic scapholunate instability. They described open surgery for the condition [2].

The postulated mechanism for the condition is that the dorsal capsule becomes hypertrophied and pinched between the extensor carpi radialis brevis muscle and the scaphoid during wrist extension [3].

What increases the ambiguity of the condition is that no radiological findings are specific for diagnosis. And the diagnosis is usually made by exclusion. However, many cases have associated apparent or occult ganglion cysts [4].

Treatment is usually conservative in the form of analgesia, splinting, activity modification, and local corticosteroid injection [5].

Surgery is reserved for failed conservative treatment and involves either open surgery or arthroscopic treatment [5].

Arthroscopy has revolutionized the diagnosis and treatment of many wrist pathologies. It provides minimal incision, preservation of the capsule, less postoperative pain, earlier return to activity, and shorter hospital stay [5].

Arthroscopic findings in dorsal wrist impingement syndrome include hypertrophied synovium, synovial fold, occult ganglion, and possible occult subclinical instability of scapholunate ligament. Arthroscopic treatment involves debridement and resection of the capsule and hypertrophied synovium [5].

We report short-term clinical and functional results of arthroscopic treatment of dorsal wrist impingement syndrome.

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Patients and methods

A prospective cohort of 20 patients diagnosed with dorsal wrist impingement syndrome are treated using wrist arthroscopy.

The Ethical committee has approved the study (IRB NO: 00012098), and informed consent has been taken from all patients.

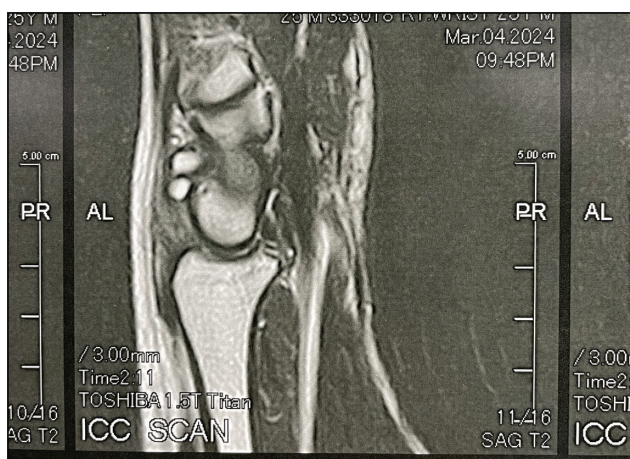
Diagnosis of dorsal wrist impingement syndrome is clinical. The patient complaints include dorsal-radial sided wrist pain, especially with activities involving wrist extension, and possibly, a dorsal ganglion at presentation. The push-up test was positive. Localized tenderness at the soft spot distal to Lister's tubercle. The Watson test was done in all patients and was associated with pain and no clunk or click.

Plain radiography of the wrist have been performed in all patients and were free. MRI has been performed in all patients. It was free except seven patients had dorsal ganglion, and five patients had occult ganglion at the scapholunate interval (Fig. 1).

All patients had a trial of conservative treatment for at least 3 months duration in the form of analgesics, splinting in extension, activity modifications, and local cortisone injection in the form of a shot of betamethazone injected in the soft spot distal to Lister tubercle in 12 patients.

Exclusion criteria included patients who had conservative treatment of fewer than 3 months duration, patients with confirmed scapholunate instability based on radiological findings, and patients with associated bony pathology or ulnar-sided wrist pain.

Figure 1



MRI of a patient showing occult ganglion

The study included 12 males and eight females. The mean age was 27 years (range from 19 to 35). The right side was involved in 16 patients and left side in four patients. The dominant side was involved in 16 patients. Seven patients had apparent dorsal wrist ganglion, while five patients had occult ganglion diagnosed by MRI.

Surgical technique

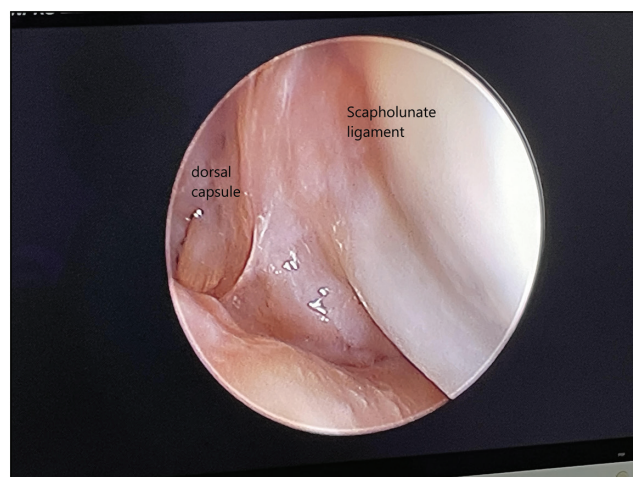
Under general anesthesia. Patients are placed supine with the arm placed on a hand table and a commercial traction tower for wrist arthroscopy is applied with a counter traction of 5 kg to decrease tension on the dorsal capsule (Fig. 2).

A tourniquet was applied in the upper arm. Arthroscopy started with making the 3/4 portal for viewing, where, a thorough diagnostic arthroscopy is performed to evaluate cartilage and other pathologies, while, the 6 R portal is performed by inside-out technique to probe cartilage and ligaments. Mid-carpal portals (radial and ulnar) were established to evaluate the scapholunate interval and detect any possible instability. The scope is switched to the 6 R portal and turned radially to view the radial side and the probe is inserted in 3/4 portal for evaluation of

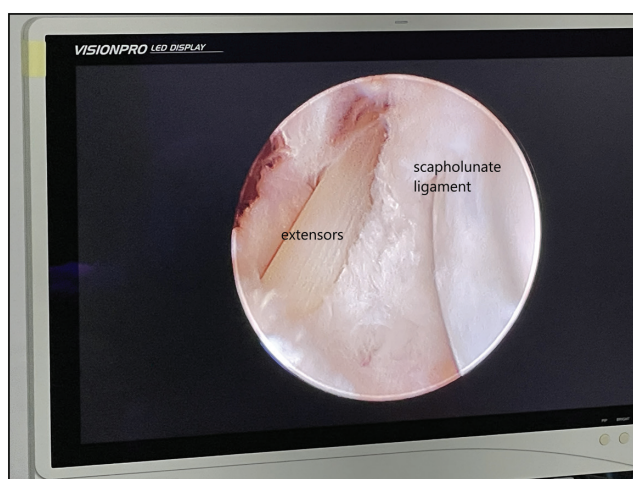
Figure 2



Setup for wrist arthroscopy

Figure 3

Scapholunate ligament from 6 R portal

Figure 4

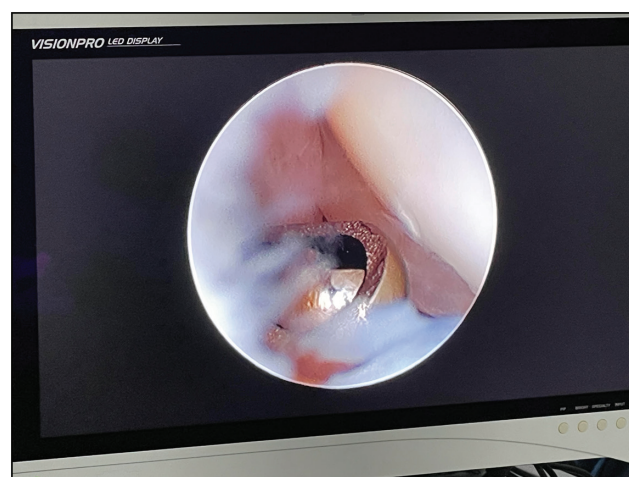
Extensor tendons after debridement of the capsule

the scapholunate ligament and dorsal capsular septum (DCSS) (Fig. 3).

A full radius shaver is inserted in 3/4 portal to debride synovitis and resect the capsule opposite the scapholunate ligament. The resection continues until the extensor tendons through the capsular defect (Figs 4 and 5).

Closure of portals and a volar splint in 20° of extension are applied for 4 weeks. Physiotherapy starts for another 4 weeks, and an active range of motion progresses gradually.

Pain is assessed using visual analog scale (VAS) score and compared preoperatively. Range of motion of flexion and extension is recorded. Grip strength is evaluated by using a dynamometer and compared

Figure 5

Shaver for debridement of the synovitis and dorsal capsule

preoperatively. Functional assessment using quick disabilities of the arm, shoulder, and hand (DASH) score is evaluated.

Statistical analysis

Comparisons of the average VAS score, range of motion, and quick DASH score between preoperative and postoperative time points were made using a paired student *t*-test with an alpha level of 0.05 set as the standard cutoff for statistical significance.

Results

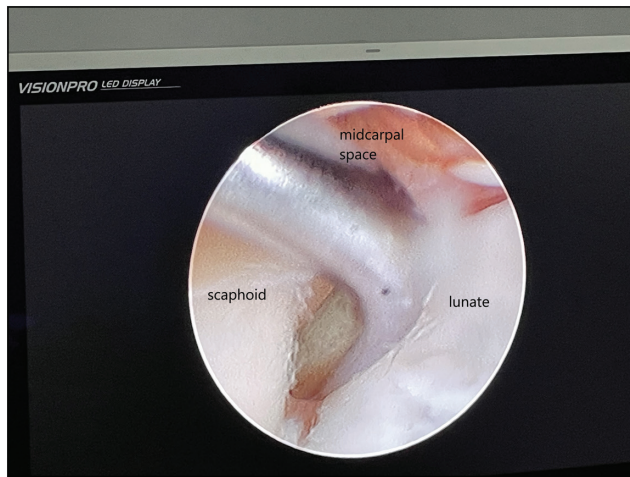
Arthroscopic findings include seven patients with apparent dorsal wrist ganglion, five patients with occult ganglion, five patients had hypertrophic synovial fold at the scapholunate interval, and three patients had synovitis with redness at the dorsal capsular septum. 13 patients had occult instability evaluated by midcarpal arthroscopy, with seven patients having Geissler grade I while, six patients had Geissler grade II instability (Fig. 6).

At the end of follow-up at a median time of 6 months after surgery (range, 4–10 months), mean VAS score improved from 5.9 preoperatively to 2 postoperatively. Mean quick DASH improved from 49.1 to 4.8. Mean strength improved from 28.1 to 33.1 kg. range of motion did not differ significantly between pre and postoperative (Table 1).

No reported postoperative complications in the study.

Discussion

Dorsal wrist impingement syndrome is a clinical syndrome characterized by dorsal-radial wrist pain,

Figure 6

Midcarpal arthroscopy for scapholunate evaluation

Table 1 Results of treatment

	Preoperative	Postoperative at 3 months period	Last follow-up	P value
VAS score (mean)	5.9	3.5	2	0.000
Strength (mean)	28.1	33.1	33.1	0.000
Quick DASH	49.1	12	4.8	0.000
Range of motion:				0.564
Flexion	75.8	73	73	
Extension	65.5	66	66	

especially with extension maneuvers. It has two types; primary, which is caused by pinching of the dorsal capsule between the scaphoid and the extensor carpi radialis brevis muscle. The secondary type is caused by a ganglion cyst either apparent or occult or secondary to scapholunate instability. Diagnosis of the primary type is usually clinical after the exclusion of secondary causes, as most radiological techniques fail to show a specific pathology related to the condition. The pathological findings related to the condition include patulous redundant dorsal capsule, synovial hypertrophy, synovitis, a ridge of bone at the scaphoid tubercle, and occult ganglion [5,6].

Watson and colleagues was the first to describe dorsal wrist impingement syndrome and considered it as the first stage of scapholunate instability. They described rotatory subluxation of the scaphoid as the main cause. They reported open surgical treatment where, a ridge of bone was resected from the scaphoid plus scaphotrapeziotrapezoid fusion. They reported excellent results with their technique. Other authors reported resection of a part of the capsule plus distal posterior interosseous nerve resection [7,8].

Wrist arthroscopy has revolutionized the diagnosis and treatment of many different wrist pathologies. It allows precise evaluation of any internal derangement of the wrist. One of the pathologies which are better diagnosed and treated using arthroscopy is dorsal wrist impingement syndrome. Arthroscopic findings vary and may include hypertrophic synovial fold, synovitis and redness of the dorsal capsule, patulous dorsal capsule, and ganglion whether occult or apparent. Another value of arthroscopy is the ability to diagnose occult scapholunate instability as a possible cause of dorsal wrist impingement. Instability is most accurately evaluated using mid carpal arthroscopy and grading of instability is done using the Geissler grading system [9–11].

Arthroscopy also allows treatment of dorsal wrist syndrome using minimal incision and hence, earlier recovery and less postoperative pain compared with open technique due to the preservation of the capsule with its important biomechanical and proprioceptive function [9,10].

Arthroscopic treatment is simple and includes debridement, synovectomy, ganglion excision, and resection of the hypertrophied patulous capsule [11].

Many authors have reported arthroscopic treatment of dorsal wrist syndrome and reported good to excellent results [11–13].

In our study, the mean VAS score improved from 5.9 preoperatively to 2 postoperatively. Mean quick DASH improved from 49.1 to 4.8. Mean strength improved from 28.1 to 33.1kg. range of motion did not differ significantly between pre and postoperative because pain is usually encountered in terminal extension. These results coincide with the results reported in other studies. Matson and colleagues described the results in 19 patients with dorsal wrist impingement syndrome. They reported improvement of symptoms at 4 months postoperatively with improvement in VAS score, quick DASH score, and Mayo wrist score [4].

Arthroscopic findings included seven apparent ganglion, five occult ganglion, five hypertrophic synovial fold, and three synovitis. These findings coincide with the findings in most studies [4,12,13].

Interestingly, 13 patients had occult instability of scapholunate interval with grading Geissler grade I or II which did not need any further intervention other than debridement. These results suggest that scapholunate instability (occult or evident) may be a possible cause for dorsal wrist impingement syndrome. This coincides with the theory postulated by Watson *et al.* [5,6].

The limitation of the study is short-term results and a small number of cases. We suggest that long-term studies are needed to evaluate for potential progression of scapholunate instability. Also, this study may open the discussion, of whether dorsal wrist ganglion is considered a manifestation of occult scapholunate instability which is not detected clinically or radiologically.

Conclusion

Wrist arthroscopy is the best modality to diagnose and treat dorsal wrist impingement syndrome. As, it allows evaluation of the scapholunate instability as a possible cause for the condition. Arthroscopic treatment is usually required when conservative treatment fails. The most common cause found in this study is scapholunate instability evaluated using midcarpal arthroscopy.

Ethical approval

The study has been approved by the ethical committee of Alexandria University.

Informed consent

Informed consent has been taken from all patients involved in the study.

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Nil.

Conflicts of interests

There are no conflicts of interest.

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