



**Original Article:**

**Optimisation of Surgical Results in de-Quervain's Disease**

**Authors**

**B Jagannath Kamath**, Prof & Head, Dept. of Orthopaedics,  
**Harsh Vardhan**, Assistant Professor, Dept. of Orthopaedics,  
**Nikil Jayasheelan**, Senior Resident, Dept. of Orthopaedics,  
**Ajith Mahale**, Prof & Head, Dept. of Radiodiagnosis,  
**Ashvini Kumar**, Profesoor, Dept. of Radiodiagnosis,  
**Kasturba Medical College, Mangalore, India.**

**Address for Correspondence**

**Dr. B. Jagannath Kamath**,  
Dept. of Orthopaedics,  
Kasturba Medical College,  
Manipal University,  
Mangalore, INDIA.  
**E-mail:** bjkamath@satyam.net.in

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**Abstract:** Background: De Quervain's disease poses more problems with respect to management than the diagnosis. Surgery is resorted to when the conservative methods fail. There are known complications of the surgical intervention. Surgeon contemplating the surgery should be aware of these and make every attempt to optimize the results and avoid the above mentioned complication. Methods: Sixty symptomatic wrists in 57 individuals suffering from de Quervain's disease who needed surgery were studied preoperatively with ultrasound. Number of tendons and the sub septae identified in the ultrasound examination preoperatively were confirmed on the table during the surgery. The release was brought about under local anesthesia, with magnification taking care to avoid injury to the cephalic vein and superficial branch of radial nerve, not to violate the anterior margin of the sheath, thus preventing complications. A negative post release finkelstein test was ensured before the wound closure. Results: All 60 patients who underwent release for de Quervain's disease were symptom free, satisfied and fully functional. Conclusions: De-Quervain's disease not relieved by conservative methods needs surgical release under local anesthesia with a transverse incision with Preoperative ultrasound examination for the number of tendons and subseptae. Avoiding the violation of the volar aspect of the sheath, loupe magnification, tourniquet and post release Finkelstein's test before wound closure, will ensure optimal results.

**Key Words:** De Quervain's tenosynovitis; Ultrasonography; Loupe; Finkelstien's test.

**Introduction:**

De-Quervain's disease is a common problem in outpatient clinic. This generally does not pose any diagnostic problems to even the trainees. Surgery can be offered if the symptoms do not respond to conservative methods or local infiltrations.(1,2) Surgical options are several often without any specific preoperative investigations. Surgery itself can be done under different anesthetic modalities using transverse (3), longitudinal (4) or oblique (5) incisions. After the release the compartmental sheath may be repaired (6) or reconstructed.(7,8) Some surgeons have even advised minimally invasive techniques in the release.(9)

Some of the drawbacks of the of the surgical interventions are inadequate release of the tendons, injury to the superficial branch of the radial nerve, volar subluxation of the tendons and hypertrophic vertical scar resulting in disfigurement.(10,11) These complications can sometimes add to the unsolved problems in failed cases resulting in agony for the patient and disrepute for the surgeon.

This study was conducted to optimize the surgical results in de Quervain's by trying to address all the above mentioned reasons for suboptimal results.

**Materials and Methods:**

A prospective study was conducted in 60 symptomatic wrists with de Quervain's disease in 57 patients who did not respond favorably to the conservative methods in KMC hospitals. The average age of the patient was 41 years. (28-61 years). There were 47 women and 10 males enrolled in the study. The diagnosis was established by the classical symptoms of local tenderness, positive Finkelstein's sign and

negative x-ray. All patients routinely underwent ultra sound examination using 12 MHZ linear array by a senior radiologist, mainly to identify the number of APL and EPB tendons and for the presence of sub septum which may be missed during surgical release. Number of APL and EPB tendons was identified by dynamic methods by moving the CMC and MP joint actively and passively in isolation.

All patients who failed to respond favorably for the conservative methods for more than 8 weeks were subjected to open release.

The procedure involved release under local anesthesia with adrenalin of 3 ml infiltration around the radial styloid process with an arm tourniquet (with the pressure 1.5 times the systolic pressure). A one and a half cm transverse incision is made centering on the radial styloid process as shown in Fig 1. Once the sub dermal fat was exposed further dissection involved blunt separation of the longitudinal structures such as cephalic vein and the superficial branch of radial nerve using a curved mosquito forceps.

Loupe magnification makes this procedure very simple. Once the sheath of the first compartment is encountered the sheath is opened vertically on the radial side of the compartment (Fig 2). The number of tendons and the sub septum determined preoperatively on the ultra sound examination (Fig 3) is correlated and confirmed on the table. Once the release was complete, tourniquet was released. This generally took 5-7 minutes and the tourniquet time was well tolerated. Now the Finkelstein was performed on the table before closing the wound to confirm the adequacy of the release. Finally the wound was closed using 4-0 ethilon followed by compression bandage.



**Fig 1: Transverse incision over the radial styloid at the wrist.**



**Fig 2: Released tendons after dorsal incision of the compartment sheath.**



**Fig 3: Two APL and one EPB tendons with fibrotic changes**

#### Results:

Pre-operative ultrasound to evaluate the number of APL and EPB tendons and the presence or the absence of the subseptum were evaluated both at the level of the radial styloid and distal to it. The distal findings were more relevant in determining the number of APL and EPB tendons. The ultrasound findings at the level of the styloid process were

useful in determining the subseptum but not the number of individual tendons. This was correlated in all patients on the table intraoperative. The tendons under the sheath proximal to the styloid process sonologically appeared to be fused (pseudo fusion) in about 1/3rd of cases, resulting in discrepancy in the actual number of tendons as confirmed on the table. Thus the sonological findings distal to the styloid process were taken into consideration in determining the number of APL and EPB tendons.

APL tendon duplication was found in 66% distal to the styloid process. All were confirmed on the table. EPB tendon duplication distal to the styloid process was found only in 12%, which were again confirmed on the table. Separate compartment for the APL and EPB was seen only in 23%. All those cases were confirmed on the table.

Sonological findings also helped us to confirm the chronicity of the disease. In long standing cases there was more synovial thickening and minimal fluid around the tendon with characteristic intratendinous internal echoes finding. In the acute and sub-acute cases there were more fluid around the tendon and less or minimal intratendinous internal echoes. The number of tendons and the subseptum detected preoperatively were all confirmed intraoperative in all 60 cases that were operated for unrelieved symptoms following conservative methods, thus proving the efficacy of ultrasound examination as the pre-operative investigations.

All 60 patients were followed up for a minimum period of 2 years and have not complained of any symptoms suggestive of recurrence, incomplete release or subluxation of the tendons.

No patient till the last follow up complained of paresthesia or any symptoms related to superficial branch of radial nerve. None of the patients had any issues with scar related to cosmesis.

#### Discussion:

Some of the common complications of tendon release in de Quervain's disease are incomplete release, recurrence of symptoms, tendon subluxations, neuroma or paresthesia related to superficial branch of radial nerve and hypertrophic operative scar as described by Belsole.<sup>(12)</sup> He reported 36 complications in 19 patients after release of the first extensor compartment for de Quervain disease. He attributed most of the complications due to vertical incision, inadequate release of the compartment and improper site of release of sheath.

Though there are researchers (Yuasa) who implicate EPB subcompartment as the sole causative agent for de Quervain's disease, it is universally accepted that both APL and EPB tendons are responsible for the symptoms.

Incidence of separate compartment for EPB varies from 20% to 30%. Clinically it will be difficult to look for isolated APL and EPB involvement in the inflammation, which allows the surgeon only to depend on preoperative ultrasonography to confirm the presence or absence of the sub septum, which separates APL and EPB. The role of ultrasonography in establishing separate the sub septum in the first compartment has been very well established. Our experience suggests that this evaluation for sub septum should be performed with the probe placed horizontally at the level of the radial styloid process. But to assess the number of tendons in the first compartment, the probe has to be more distal to the radial styloid process to avoid the misleading phenomenon of pseudo fusion of the tendons to the tune of 20% to 30%.

The main reason for the recurrent symptoms is inadequate primary release due to anomalous tendons contained in different sub sheath. This can be preoperatively detected by ultrasound examination which can ensure that the release has been complete and appropriate. The pre-operative ultrasound evaluation results, in terms of the number of APL & EPB tendons and also the incidence of the anomalous sub septae

in the first compartment, matches with that of the other reports published in the literature.(13-16)

Transverse incision along the line of the skin crease which corresponds with Langer lines at the radial styloid minimizes the scar hypertrophy, hence it is recommended to use in routine case and reserve the vertical and modified oblique incision during surgery for recurrence. Local anesthesia will ensure the patient co-operation for the post release pain free Finkelstein test which can be the ultimate reassuring thing both for the patient and the surgeon.

The blunt dissection separating the troublesome veins and the superficial nerve longitudinally aided by loupe magnification minimizes the iatrogenic injury to the superficial branch of the radial nerve. As the incision is very small and the structures to be protected are very important, we strongly recommend the usage of loupe magnification during surgery. Conscious effort not to violate the anterior margin of the sheath while releasing avoids post-operative tendon subluxation and the painful clicking sound due to unstable tendon.

With the above mentioned pre-operative (especially preoperative ultrasound examination of the first dorsal compartment for determination of the number of APL & EPB tendons and presence or absence of sub setae in the sheath) and intra operative care and steps, one can optimize the surgical results in tendon release in de Quervain's disease.

#### **Conclusion:**

We conclude that with the following precautions, surgeons might optimize the surgical results in de Quervain's disease.

1. Preoperative ultrasonography assessment of the number of tendons and the presence of sub septum in the first dorsal compartment.
2. Use of arm tourniquet
3. Exploration with a transverse incision at the radial styloid with the use of local anesthetic with epinephrine.
4. Protection of vital structures by blunt dissection under magnification.
5. Dorsal release of the compartment to avoid tendon subluxation.
6. Intraoperative correlation with the number of tendons with preoperative ultrasonography findings.
7. On table pre and post release finkelstien's test to confirm the adequacy of the release.

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