Intra-Operative "Passive Gliding" Technique for de Quervain's Disease : A Prospective Study

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Abstract

An intra-operative "passive gliding" maneuver was performed to identify the extensor pollicis brevis tendon during surgical decompression for de Quervain's disease in 40 involved wrists. All the patients were relieved of their symptoms and no recurrence occurred after one year of follow-up. By performing this intra-operative maneuver surgeons can prevent incomplete decompression in de Quervain's disease, regardless of the anatomical variation of the first extensor compartment.

Key word : De Quervain's Disease, Operation, Treatment, Passive Gliding, Extensor Pollicis Brevis Tendon

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De Quervain's disease is initially treated conservatively. If conservative treatment fails or if there is recurrence, surgical decompression of the first extensor compartment of the wrist gives reasonably good results[1]. However, there have been reports of failure of surgery due to incomplete decompression[2-4], which is mostly due to the unreleased separate extensor pollicis brevis (EPB) compartment[4]. Separation of the first extensor compartment has been found in cadaveric dissections as well as intra-operatively during surgical release [5-10]. The method to identify EPB tendon intra-operatively is, therefore, important in order to prevent incomplete decompression.

In the past, it has been recommended that the EPB tendon be identified by demonstrating passive extension of the metacarpophalangeal joint of the thumb by gentle retraction of the tendon found

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in the osteofibrous tunnel during the operation[11]. This method of identifying the tendon may not be absolute as failures of surgery due to inadequate decompression have been reported[2-4].

Intra-operative "passive gliding" maneuver is a simple method to identify specifically the EPB tendon during surgical decompression. We report the result of surgical treatment of de Quervain's disease in 40 involved wrists by using this simple method to ensure complete release of the first extensor compartment.

MATERIAL AND METHOD

From January 1998 to November 1999 forty wrists in 39 patients were operated upon for decompression of the first extensor compartment. All the patients were diagnosed as suffering from de Quervain's disease from their history of pain over the radial aspect of the wrist aggravated by excessive use of the thumb and wrist, and positive Finkelstein's test. None of them had satisfactory improvement with conservative treatment. From the history and clinical examination, we excluded patients with rheumatoid arthritis, arthritis around the wrist and thumb, trauma to the wrist and thumb, pregnancy, and prior surgery to the wrist for de Quervain's disease. The pathology of the disease, modes of treatment and complications pertaining to different modes of treatment were explained to the patients. All the patients gave their consent for surgery.

We recorded the patient's age, sex, duration of symptoms, number of times the symptoms recurred, any prior treatment received, side of dominant hand, and profession. All the patients were operated on under an aseptic technique without the use of tourniquet and under local anesthesia. Approximately 1 to 1.5 cms long transverse skin incision was used proximal to the tip of the radial styloid by about 1 cm. After identifying the first extensor compartment of the wrist, a longitudinal incision was made along the roof of the osteofibrous tunnel and the content of the tunnel was visualized.

To identify the tendon in the tunnel, a passive gliding maneuver is performed by stabilizing the patient's first metacarpal bone with one hand and passively flexing and extending the first metacarpophalangeal joint with the other hand while observing gliding of the tendon in the decompressed tunnel. The tendon that is seen gliding is the EPB tendon and the tendon that is not gliding is the abductor pollicis longus (APL) tendon.

If both the gliding and the non-gliding tendons are seen in the decompressed osteofibrous tunnel, the gliding tendon distally should be followed. If the distal part of the gliding tendon (EPB) is covered by a longitudinal septum that is separate from the distal part of the non-gliding tendon (APL), the patient has an incomplete septum of the first extensor compartment of the wrist. The distal longitudinal septum must be incised longitudinally to complete the release of the EPB tendon. If the distal part of the gliding tendon (EPB) is not covered by any septum, the patient has a single compartment and the decompression is complete.

If no tendon is seen gliding, it means the tunnel decompressed contains only APL tendon or contains the APL tendon and tightly trapped EPB tendon in some cases of incomplete septum. In this case, one should follow every non-gliding tendon distally. If the distal part of any non-gliding tendon is covered by a distal septum, which is separated from the distal part of the other non-gliding tendons (APL), the patient may have an incomplete septum with the EPB tendon tightly trapped in it. The distal septum must be incised longitudinally to complete the release of the trapped EPB tendon. The passive gliding maneuver should be repeated to ensure gliding of EPB tendon.

If no distal septum is seen, all of the non-gliding tendons are likely to be APL tendons. Skin and subcutaneous tissue should then be retracted dorsally and proximally to look for another tendon which should be pass into an osteofibrous tunnel just dorsal to the decompressed tunnel. The fibrous roof of this osteofibrous tunnel should be incised and opened longitudinally (for about 5 mm). The passive gliding maneuver is performed again. If the tendon is seen gliding, it is the EPB tendon. This patient would have a complete longitudinal septum separating the first extensor compartment into the ventral and dorsal subcompartments containing the APL and EPB tendons respectively. In this case the tunnel first decompressed, was the ventral subcompartment containing the APL tendon; therefore, the dorsal subcompartment has to be decompressed as well to complete the release.

If no tendon is found just dorsal to the APL tendon, one should look for more dorsal farther away from the APL. If the EPB tendon is absent,

a large tendon will be seen at some distance from the APL. This is the extensor carpi radialis longus tendon passing through the second extensor compartment of the wrist, which can be confirmed by performing passive flexion and extension of the wrist. Thus, in this patient the EPB tendon is absent, therefore, the tunnel decompressed is the first extensor compartment containing only the APL tendon, and the decompression should be considered complete.

We recorded the intra-operative findings as to the number of APL and EPB tendons, the incidence of ganglion on the fibrous roof and variations in the septation of the first extensor compartment of the wrist.

No immobilization was given post-operatively. Sutures were removed seven to ten days after the surgery, and the patients were followed-up for a minimum of one year.

RESULT

Of the 39 patients there was one male and 38 females. One patient had bilateral involvement. Ages ranged from 17 to 81 years. One patient was 17 years old, eight patients were between 21 and 30 years, ten patients between 31 and 40 years, six patients between 41 and 50 years, nine patients between 51 and 60 years, four patients between 61 and 70 years and one patient was 81 years old. All the patients were operated upon because there had been no improvement after conservative treatment. Seventeen wrists were operated on after the first attack, 15 after the second attack, six after the third attack and two after the fourth attack. Twenty-five wrists were on the non-dominant side and 15 on the dominant side. We were able to identify the EPB tendon in all the cases by using the intra-operative "passive gliding" maneuver. There was complete septum in 17 wrists, incomplete septum in 10 wrists, and no septum in 13 wrists. There was no case with absence of the EPB tendon. We found ganglion of the fibrous roof of the first extensor compartment in seven wrists and performed excision of the ganglion in all the cases. The number of APL tendons found in relation to the various types of the first extensor compartment is shown in Table 1.

After surgery, all the patients were relieved of the symptoms of de Quervain's disease. Immediately after surgery, 12 wrists had mild pain that subsided within two to four weeks post-operatively, eight wrists had swelling that subsided within one to three weeks and six wrists had paraesthesia along the distribution of the superficial radial nerve distal to the incision which subsided in two to eight weeks. All the patients were able to return to their original work within four to ten weeks. There was no recurrence after at least one year of follow-up.

DISCUSSION

Standard textbooks of anatomy describe the first extensor compartment of the wrist simply as an osteofibrous tunnel through which passes the APL and EPB tendons, thus, giving the impression that the first extensor compartment is a single compartment with two tendons passing through it. Jackson[6] reported the anatomical variation of the first extensor compartment of the wrist in cadavers as well as in patients who had received surgery for de Quervain's disease. He described the presence of septation and the number of tendons of the EPB and

Table 1. Relationship of the number of APL tendons found in the osteofibrous tunnel with septation of the first extensor compartment of the wrist.

No. of APL tendons	Type of first extensor compartment		
	Single compartment	Incomplete septum	Complete septum
1	4	3	7
2	4	5	9
3	5	0	1
4	0	1	0
5	0	1	0

APL = Abductor pollicis longus

APL. He found absence of EPB tendon in two per cent of cadavers. There have been a number of reports[2-5] about the problem of incomplete decompression for de Quervain's disease in relation to the anatomical variation of the first extensor compartment of the wrist. Ta[1] and Jackson[6] reported the incidence of septation of the first extensor compartment of the wrist in patients with de Quervain's disease in 72 per cent and 67.5 per cent respectively. But both these reports did not differentiate complete from incomplete septation. Jackson[6] reported finding more than one APL tendon in the first extensor compartment of the wrist in 72.33 per cent of cadavers and in 67.5 per cent of patients with de Quervain's disease. Yuasa[7] recommended limited surgical treatment by decompressing only the EPB subcompartment, but did not comment on the septation of the first extensor compartment of the wrist. Most reports[6-10] did not elaborate on the method of identification of the tendons during surgical decompression.

If, during the surgical decompression of the first extensor compartment, one is not able to clearly identify the tendons of APL and EPB, chances are that the decompression will be incomplete. In the past, it has been recommended that an arterial clamp be inserted under the tendons one by one to observe the movements of the thumb when the clamp is pulled[11]. If there is abduction of the first metacarpal bone, the tendon is APL and if there is extension of the metacarpophalangeal joint, the tendon is EPB. But this method of identifying the tendons has some disadvantages, for example:

1. The patient may feel some discomfort from this maneuver because the operation is done under local anesthesia.

2. Movements of the thumb may not be clear if the tendon of the APL is small in size and is inserted in the fascia of the thenar eminence or the trapezium. Thus, the surgeon may not be confident with the adequacy of decompression. Also, pulling the EPB may cause movement of the thumb metacarpal and, thus, create confusion.

3. Pulling may cause injury to the tendons if it is not done gently or if it is done several times in order to be sure of the movements.

4. The patient may actively contract the muscles causing difficulty in identification and may also cause injury to the tendons.

Because of the problems sited above, the authors propose the passive gliding maneuver for identification of the EPB tendon during surgical decompression for de Quervain's disease[12]. The authors have used this maneuver with the patients and were able to specifically identify the EPB tendon intra-operatively and were also able to identify anatomical variations of the first extensor compartment of the wrist. Complete septum was found in 17 wrists, ten of which contained more than one APL tendon in the volar subcompartment. Therefore, if the tendon within the osteofibrous tunnel decompressed is not properly identified, it might result in inadequate decompression.

The authors realize that the number of patients in the present study is small and the duration of follow-up is short. But by performing the intraoperative passive gliding maneuver, it was possible to identify the EPB tendon specifically and the problem of inadequate decompression due to anatomical variations of the first extensor compartment of the wrist was prevented. This maneuver also has several advantages over other methods of identifying tendons used in the past:

1. The patient will not feel any discomfort while this the maneuver is performed. The patient will only feel the thumb being moved by the surgeon.

2. The surgeon can clearly identify which tendon is gliding and which is not while performing this maneuver.

3. This maneuver does not cause injury to the tendon being evaluated, even if it is performed several times.

4. During the maneuver, if the patient actively contracts the muscle of the tendons being evaluated, it will not injure the tendons and will not affect the interpretation of the evaluation.

5. It is a simple and easy maneuver that can be performed by any surgeon and is an evaluation method that can prevent the problem of inadequate decompression regardless of the type of anatomical variation of the first extensor compartment of the wrist.

In conclusion, the passive gliding maneuver during surgical decompression is a simple and easy intra-operative maneuver that can be performed to identify the EPB tendon while performing decompression for de Quervain's disease, and thus prevent incomplete decompression.

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เทคนิคเอ็นถูกทำให้เคลื่อนขณะผ่าตัดสำหรับโรคเดอ เกอร์แวง : การศึกษาไปข้างหน้า

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ได้ใช้วิธี "เอ็นถูกทำให้เคลื่อน" ในขณะผ่าตัดเพื่อระบุเอ็นของกล้ามเนื้อ เอ็กซ์เทนเซอร์ พอลลิซิส บรีวิส ในการรักษาโรค เดอ เกอร์แวง 40 ข้อมือ ผู้ป่วยทุกคนหายปวดและไม่พบการเป็นซ้ำของโรคนี้หลังจากติดตามการรักษา 1 ปี ด้วยการทำวิธีดังกล่าวขณะผ่าตัด ศัลยแพทย์สามารถป้องกันการผ่าตัดที่ไม่สมบูรณ์ในผู้ป่วยโรค เดอ เกอร์แวงได้ ไม่ว่าจะมีความแปรปรวนของลักษณะทางกายวิภาคของช่องทางผ่านของเอ็นหลังข้อมือช่องแรกเป็นแบบใดก็ตาม

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